WIDE-AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #43

Reporting Period: October 1 to December 31, 2012

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FAA/William J. Hughes Technical Center
NSTB/WAAS T&E Team
Atlantic City International Airport, NJ 08405
Website: http://www.nstb.tc.faa.gov/

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, #43, covers WAAS performance during the period from October 1, 2012 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 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)	Arcata 1.362 meters	Denver 0.616 meters	Cold Bay 0.699 meters	Anchorage 0.576 meters
95% Vertical Accuracy (VPL <= 50 meters)	Miami 1.954 meters	Salt Lake City 0.822 meters	Anchorage 1.351 meters	Juneau 1.013 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Bangor 99.99%	Cold Bay 99.96%	Barrow 99.82%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Multiple Sites100%	Oakland 99.97%	Cold Bay 99.99%	Barrow 99.73%
LPV 200 Availability (HPL <= 40 meters & VPL < =35 meters)	Multiple Sites 100%	Arcata 97.86%	Bethel 99.82%	Cold Bay 94.66%
99% HPL	Miami 19.447 meters	Denver 10.712 meters	Cold Bay 29.285 meters	Fairbanks 13.736 meters
99% VPL	Oakland 34.254 meters	Chicago 18.011 meters	Cold Bay 38.558 meters	Juneau 22.78 meters

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1.0 INTRODUCTION

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

Location	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	81	7038731
Atlantic City	92	7925589
Grand Forks	83	7130650
Oklahoma City	85	7340012
WAAS:		
Albuquerque	92	7943323
Anchorage	92	7948045
Atlanta	92	7948046
Barrow	92	7947512
Bethel	92	7946054
Billings	92	7946295
Boston	92	7948050
Chicago	92	7948030
Cleveland	92	7945921
Cold Bay	92	7947288
Dallas	92	7944668
Denver	92	7947413
Fairbanks	92	7947894
Gander	92	7948047
Goose Bay	92	7947974
Houston	92	7947533
Iqaluit	90	7772169
Jacksonville	92	7948051
Juneau	92	7943290
Kansas City	92	7948051
Kotzebue	92	7947643
Los Angeles	92	7948045
Memphis	92	7948051
Merida	92	7946826
Mexico City	92	7948032
Miami	92	7947479
Minneapolis	92	7948050
New York	92	7930860
Oakland	92	7947558
Puerto Vallarta	92	7934149
Salt Lake City	92	7947496
San Jose Del Cabo	92	7946932
Seattle	92	7946198
Washington DC	92	7947481
Winnipeg	92	7932249

**San Juan offline for roof reconstruction

Table 1-3 NPA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7933736
Anchorage	92	7933737
Atlanta	92	7933688
Barrow	92	7930366
Bethel	92	7931619
Billings	92	7931963
Boston	92	7933502
Cleveland	92	7933732
Cold Bay	92	7931117
Fairbanks	92	7931877
Gander	92	7932331
Honolulu	92	7933724
Houston	92	7933736
Iqaluit	92	7926351
Juneau	92	7929267
Kansas City	92	7933735
Kotzebue	92	7932082
Los Angeles	92	7932081
Merida	92	7933728
Miami	92	7932084
Minneapolis	92	7933728
Oakland	92	7933732
Salt Lake City	92	7933734
San Jose Del Cabo	92	7908396
San Juan	42	3605168
Seattle	87	7516040
Tapachula	92	7908704
Washington DC	92	7933733

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. IGS Precise Orbits 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
09/30/12	10/01/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity caused increased GIVE levels which in turn caused a significant reduction in LPV and LPV200 coverage. Kp reached 7 on October 1st . The majority of the impact was in Alaska and western Canada, with less severe impact to north central CONUS and the west coast.
10/06/12	10/06/12	GEO138, Atlanta (CnV)	None	C&V selected source CRE (PRN = 138) switched from ZTL to ZLA after ZTL faulted with no impact on service. TOW 542102-542104

START DATE	END DATE	LOCATION SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
10/08/12	10/08/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity caused increased GIVE levels which in turn caused a minor reduction in LPV200 coverage.
10/09/12	10/09/12	Washington DC (ZDC1), Washington DC (ZDC2)	Local	Localized RFI event at Washington DC caused a brief LPV200 outage.
10/09/12	10/09/12	Fairbanks (FAI1), Fairbanks (FAI2), Fairbanks (FAI3), Kotzebue (OTZ1), Kotzebue (OTZ2), Kotzebue (OTZ3)	None	Geomagnetic activity (Kp = 6) caused higher than normal VPE maximums. Scintillation is the suspected cause. The peak ratio of vertical error to vertical protection bounds was elevated at multiple sites in Alaska, the ratio at Fairbanks ratio exceeded 0.6. See DR 111 Vertical Position Errors Increased at Fairbanks due to Ionospheric Scintillation
10/13/12	10/13/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska	Elevated GIVES caused by geomagnetic activity (Kp = 5) slightly degraded LPV200 coverage in Alaska.
10/14/12	10/14/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Elevated GIVES caused by geomagnetic activity (Kp=5) caused loss of coverage in northern Canada. The majority of the impact was at the LPV200 level of service with LPV only being impacted for in the extreme north.
10/20/12	10/20/12	PRN21	LPV200_Alaska, LPV200_Canada	A carrier phase spike on the L1 signal on PRN-21 caused WAAS to issue a SV alert at 22:55:49 GMT (600973). The temporary loss of PRN-21 caused a short LPV200 outage in eastern Alaska and western Canada.
10/26/12	10/26/12	PRN1	LPV200_Canada	Planned Maintenance. NANU 2012066
10/30/12	10/30/12	PRN135	LPV200_Alaska	Cancelled delta-V had already been entered into the system. TOW 214677-219384 (14-15)
10/31/12	11/04/12	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	Local	RFI event at Iqaluit causing short losses of satellite tracking. See DR 112 RFI at Iqaluit caused Loss of Satellite Tracking.
11/01/12	11/01/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Elevated GIVE values caused by geomagnetic activity (Kp=4) resulted in significant reductions in LPV200 coverage in Alaska and Canada and minor LPV200 impact to CONUS. There were also minor LPV impacts in Alaska and Canada. Slightly elevated errors were also observed.
11/13/12	11/14/12	GEO135, NAPA (APC)	LPV_Alaska,	Manual GUS switchover due to

START DATE	END DATE	LOCATION SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
			LPV200_Alaska	maintenance at NAPA. TOW 201631-201636
11/13/12	11/13/12	PRN23	LPV_Alaska, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	NANU 2012069
11/13/12	11/14/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity caused loss of coverage for over 5 hours at the end of Nov. 13th and the beginning of Nov. 14th.. Moderate impact to Canada and Alaska. Kp = 4 on November 13th Kp = 6 on November 14th
11/14/12	11/14/12	PRN24	None	PRN24 (IIF-3) initially set healthy slot A2.
11/20/12	11/20/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Elevated GIVE values caused by geomagnetic activity (Kp = 4) caused loss of coverage in Northeast Canada.
11/21/12	11/21/12	PRN32	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	NANU 2012074
11/23/12	11/23/12	GEO135, Littleton (APA)	LPV200_Alaska	LTN SGS Clock anomaly. Elevated UDRE values lasted through the day rollover. Loss of ranging causing loss of LPV200 service on November 23rd and 24th in north western Alaska. TOW 461510-461513
11/23/12	11/23/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Elevated GIVES caused by geomagnetic activity (Kp = 4) had a minor affect on Canada LPV200 coverage.
11/24/12	11/24/12	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV200_Alaska, LPV200_Canada	Elevated GIVES caused by geomagnetic activity caused about a 3% loss of LPV and LPV200 availability over Alaska. The activity also caused short LPV200 outages on the north western coast of CONUS and the eastern tip of Canada.
11/28/12	11/28/12	PRN2	LPV_Mexico, LPV200_CONUS, LPV200_Alaska, LPV200_Mexico	NANU 2012075
12/08/12	12/08/12	GEO135	LPV200_Alaska	PNE anomaly at Littleton caused a carrier phase discontinuity in the uplink that resulted in two WAAS User Messages (WUMs) being lost. The anomaly also caused a perturbation in the ranging loops that resulted in the Code Carrier Coherence (CCC)

START DATE	END DATE	LOCATION SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
				monitor tripping, which caused the UDRE for PRN-135 to be set to DNU. The elevated UDRE values caused loss of LPV200 service in north western Alaska on Dec. 8th and Dec. 9th. TOW 543220-543223.
12/10/12	12/10/12	PRN135	LPV200_Alaska	Reoccurrence of the12/8/12 anomaly. TOW 132346-141691 (10-15)
12/12/12	12/13/12	PRN30	LPV200_Alaska	NANU 2012081
12/13/12	12/13/12	GEO135	LPV200_Alaska	GUS switchover to Napa after Littleton faulted. TOW 346986-347000

Table 1-6 WAAS Upgrades

There are no WAAS upgrades for this quarter.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location/ Satellite	Service Affected	Event Description
10/05/12	10/05/12	Faulted	GEO135, Littleton (APA)	LPV_Alaska, LPV200_Alaska	GUS switchover to Napa after Littleton faulted. TOW 435821-435833. Elevated UDRE values caused loss of LPV200 coverage in Alaska on days Oct. 5th and Oct. 6th.
10/07/12	10/07/12	Faulted	GEO133, Santa Paula (SZP)	None	GUS switchover to Pamalu after Santa Paula faulted. TOW 73413-73431
10/08/12	10/08/12	Faulted	GEO133, Pamalu (HDH)	None	GUS switchover to Santa Paula after Pamalu faulted. TOW 113392-113405
10/08/12	10/08/12	Manual	GEO138, Brewster (BRE-B)	None	GUS manual switchover from Brewster to Woodbine. TOW 115578-115583.
10/27/12	10/27/12	Manual	GEO138, Woodbine (QWE)	None	Purposely switched from Woodbine to Brewster-B in preparation for Hurricane Sandy. TOW 547251-547256
11/13/12	11/14/12	Manual	GEO135, NAPA (APC)	LPV_Alaska, LPV200_Alaska	Manual GUS switchover due to maintenance at Napa. TOW 201631-201636
12/13/12	12/13/12	Faulted	GEO135	LPV200_Alaska	GUS switchover to Napa after Littleton faulted. TOW 346986-347000
12/17/12	12/17/12	Manual	GEO138, Brewster (BRE-B)	None	GUS manual switchover from Brewster-B to Woodbine TOW 108058-108063
12/26/12	12/26/12	Manual	GEO138,Woodbine (QWE)	None	GEO 138, manual switchover from Woodbine to Brewster-B due to weather related issues. TOW 326349-326354

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.

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 1.362 meters at Arcata and 1.954 meters at Miami. The minimum 95% CONUS horizontal and vertical LPV errors are 0.616 meters at Denver and 0.822 meters at Salt Lake City, respectively. The maximum 95% and 99.999% NPA horizontal errors are 6.779 meters at Honolulu and 14.495 meters at Tapachula, respectively. The minimum 95% and 99.999% horizontal errors are 1.283 meters at Oakland and 3.317 meters at Seattle, respectively.

Table 2-1 shows Iqaluit, Barrow, and Kotzebue were not in PA mode 100% of the reporting period. Iqaluit was due to localized radio frequency interference (RFI) which interrupted PA mode service; see DR 112 RFI at Iqaluit caused Loss of Satellite Tracking. Barrow and Kotzebue were due to a GUS switchover on GEO 135 which interrupted PA mode service.

The increases in 95% position errors on 10/1/12, 11/1/12, and 11/14/12 in Figures 2-1 to 2-8 were due to geomagnetic activity. The increases in 95% NPA position errors on 10/13/12 to 10/14/12 in Figures 2-7 to 2-8 were also 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	1.362	1.362	1.551	100	*	*
Atlantic City	1.326	1.326	1.399	100	*	*
Grand Forks	1.104	1.104	1.364	100	*	*
Oklahoma City	0.792	0.792	1.507	100	*	*
Albuquerque	0.684	0.684	0.981	100	2.093	5.214
Anchorage	0.576	0.578	1.351	100		
Atlanta	0.748	0.748	1.371	100	2.398	5.238
Barrow	0.686	0.690	1.378	99.99728	*	*
Bethel	0.580	0.580	1.036	100	2.049	6.655
Billings	0.797	0.797	0.990	100	2.131	4.671
Boston	0.790	0.790	1.014	100	2.400	4.188
Chicago	0.922	0.922	0.924	100	*	*
Cleveland	0.713	0.713	0.940	100	2.346	4.517
Cold Bay	0.699	0.699	1.177	100	*	*
Dallas	0.725	0.725	1.423	100	*	*
Denver	0.616	0.616	0.864	100	*	*
Fairbanks	0.588	0.590	1.200	100	2.137	6.501
Gander	0.762	0.762	1.172	100	*	*
Goose Bay	0.767	0.767	1.175	100	*	*
Houston	0.759	0.759	1.669	100	2.334	5.657
Iqaluit	1.149	1.156	1.779	99.99992	*	*
Jacksonville	0.843	0.843	1.632	100	*	*
Juneau	0.696	0.698	1.013	100	*	*
Kansas City	0.710	0.710	0.909	100	2.323	4.846
Kotzebue	0.633	0.636	1.234	99.99985	2.112	6.727
Los Angeles	0.817	0.817	1.137	100	2.017	5.950
Memphis	0.772	0.772	1.148	100	*	*
Merida	0.749	0.750	1.908	100	*	*
Mexico City	0.861	0.861	1.908	100	*	*
Miami	0.957	0.957	1.954	100	2.505	5.653
Minneapolis	0.792	0.792	0.850	100	2.247	4.658
New York	0.843	0.843	0.992	100	*	*
Oakland	0.678	0.678	1.027	100	2.091	6.025
Puerto Vallarta	0.818	0.818	1.566	100	*	*
Salt Lake City	0.685	0.685	0.822	100	2.123	5.039
San Jose Del Cabo	0.824	0.824	1.750	100	*	*
Seattle	0.762	0.762	0.926	100	2.066	5.338
Washington DC	0.834	0.834	1.156	100	2.521	4.657
Winnipeg	0.792	0.792	1.078	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	1.378	5.225	100	5.394
Anchorage	1.629	4.320	100	4.577
Atlanta	1.590	4.656	100	4.930
Barrow	1.749	3.987	100	4.152
Bethel	1.674	4.347	100	4.535
Billings	1.729	3.964	100	4.125
Boston	1.806	3.761	100	3.991
Cleveland	1.495	3.480	100	3.848
Cold Bay	1.436	4.914	100	5.070
Fairbanks	1.734	4.501	100	4.674
Gander	1.788	4.858	100	5.037
Honolulu	6.779	14.213	100	14.553
Houston	1.655	4.877	100	5.071
Iqaluit	2.389	5.140	100	5.270
Juneau	1.556	4.091	100	4.180
Kansas City	1.437	3.791	100	5.897
Kotzebue	1.699	4.195	100	6.675
Los Angeles	1.429	4.754	100	5.035
Merida	1.925	6.821	100	7.343
Miami	1.627	5.668	100	5.825
Minneapolis	1.665	3.551	100	3.717
Oakland	1.283	4.882	100	5.074
Salt Lake City	1.443	4.794	100	5.046
San Jose Del Cabo	1.720	8.909	100	9.193
San Juan	2.358	13.771	100	14.272
Seattle	1.469	3.317	100	3.554
Tapachula	3.402	14.495	100	15.045
Washington DC	1.777	4.415	100	4.572

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	2.920	0.252	0.258	4.462	0.155	0.188
Atlantic City	2.860	0.221	0.246	3.611	0.161	0.205
Grand Forks	2.871	0.300	0.300	4.513	0.192	0.254
Oklahoma City	2.098	0.156	0.185	4.716	0.219	0.260
Albuquerque	2.467	0.168	0.230	3.384	0.094	0.169
Anchorage	2.791	0.073	0.175	4.460	0.119	0.185
Atlanta	1.986	0.191	0.197	2.825	0.140	0.181
Barrow	3.216	0.170	0.182	6.576	0.159	0.228
Bethel	2.158	0.067	0.132	3.610	0.079	0.139
Billings	2.142	0.185	0.195	2.882	0.172	0.172
Boston	2.018	0.124	0.184	2.871	0.155	0.161
Chicago	1.976	0.224	0.224	3.695	0.208	0.230
Cleveland	1.912	0.157	0.197	3.409	0.251	0.252
Cold Bay	2.167	0.088	0.106	4.660	0.107	0.128
Dallas	2.482	0.222	0.243	3.906	0.164	0.238
Denver	2.145	0.207	0.208	3.125	0.125	0.174
Fairbanks	2.888	0.087	0.192	14.020	0.621	0.621
Gander	3.249	0.132	0.132	3.431	0.092	0.118
Goose Bay	3.218	0.183	0.183	4.731	0.157	0.174
Houston	2.274	0.208	0.213	3.935	0.208	0.259
Iqaluit	5.362	0.138	0.168	5.579	0.151	0.184
Jacksonville	2.241	0.197	0.206	3.590	0.196	0.196
Juneau	2.623	0.235	0.235	6.144	0.310	0.310
Kansas City	2.111	0.224	0.224	2.733	0.162	0.186
Kotzebue	3.076	0.115	0.174	6.724	0.192	0.192
Los Angeles	2.409	0.153	0.194	3.486	0.168	0.196
Memphis	2.280	0.227	0.227	2.741	0.205	0.205
Merida	2.360	0.102	0.193	6.827	0.205	0.258
Mexico City	2.900	0.115	0.179	3.943	0.178	0.178
Miami	2.311	0.098	0.158	4.563	0.206	0.206
Minneapolis	1.791	0.182	0.193	2.927	0.218	0.218
New York	2.000	0.167	0.174	2.484	0.111	0.160
Oakland	2.472	0.164	0.182	3.138	0.117	0.166
Puerto Vallarta	2.769	0.152	0.152	3.914	0.082	0.148
Salt Lake City	2.198	0.173	0.181	2.576	0.176	0.176
San Jose Del Cabo	2.385	0.101	0.158	4.348	0.088	0.162
San Juan	4.130	0.125	0.142	1.770	0.037	0.037
Seattle	3.294	0.187	0.205	3.241	0.187	0.187
Washington DC	2.008	0.185	0.197	2.925	0.171	0.171
Winnipeg	3.830	0.260	0.260	4.276	0.164	0.214

Figure 2-1 LPV 95% Horizontal Accuracy

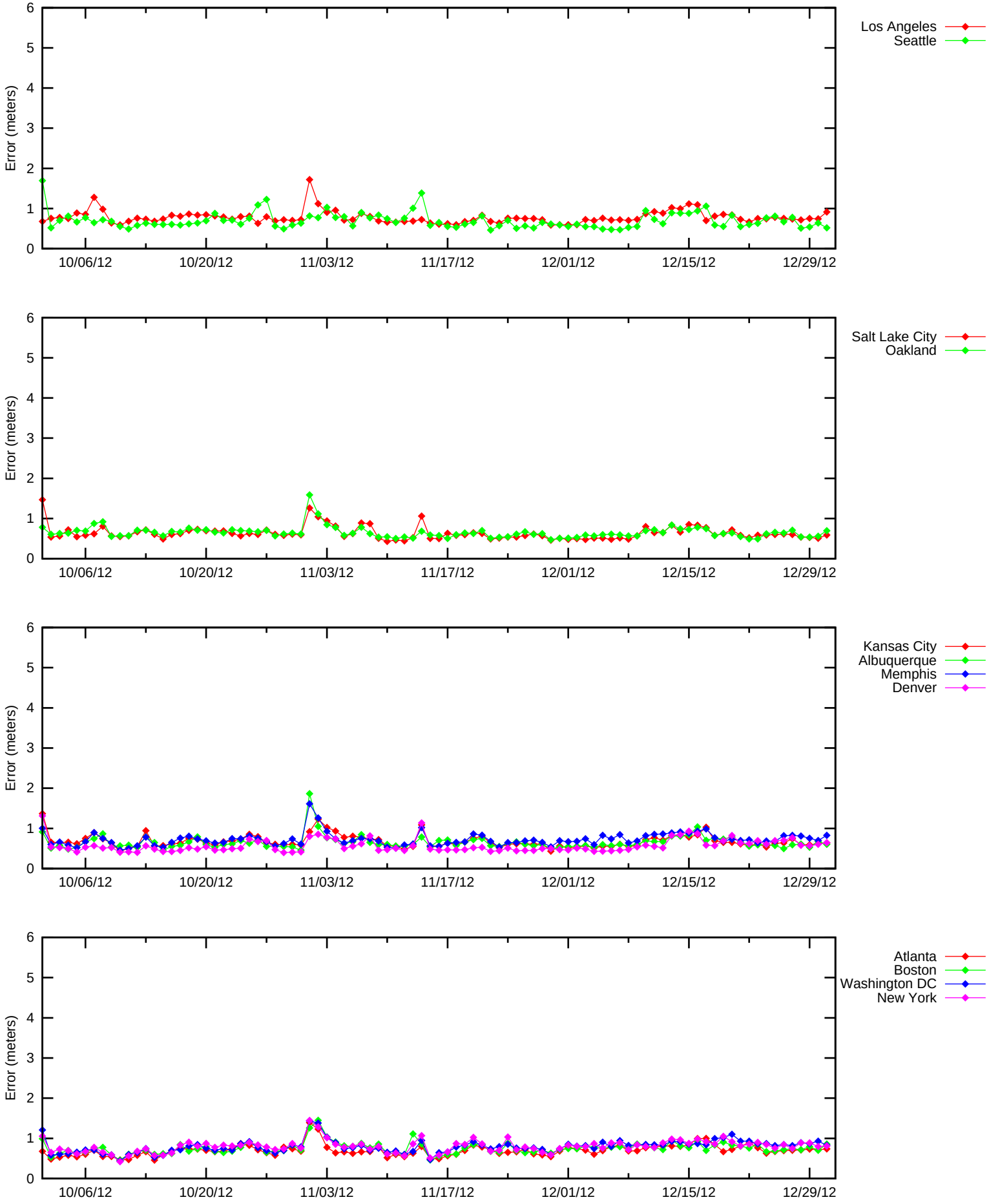


Figure 2-2 LPV 95% Horizontal Accuracy

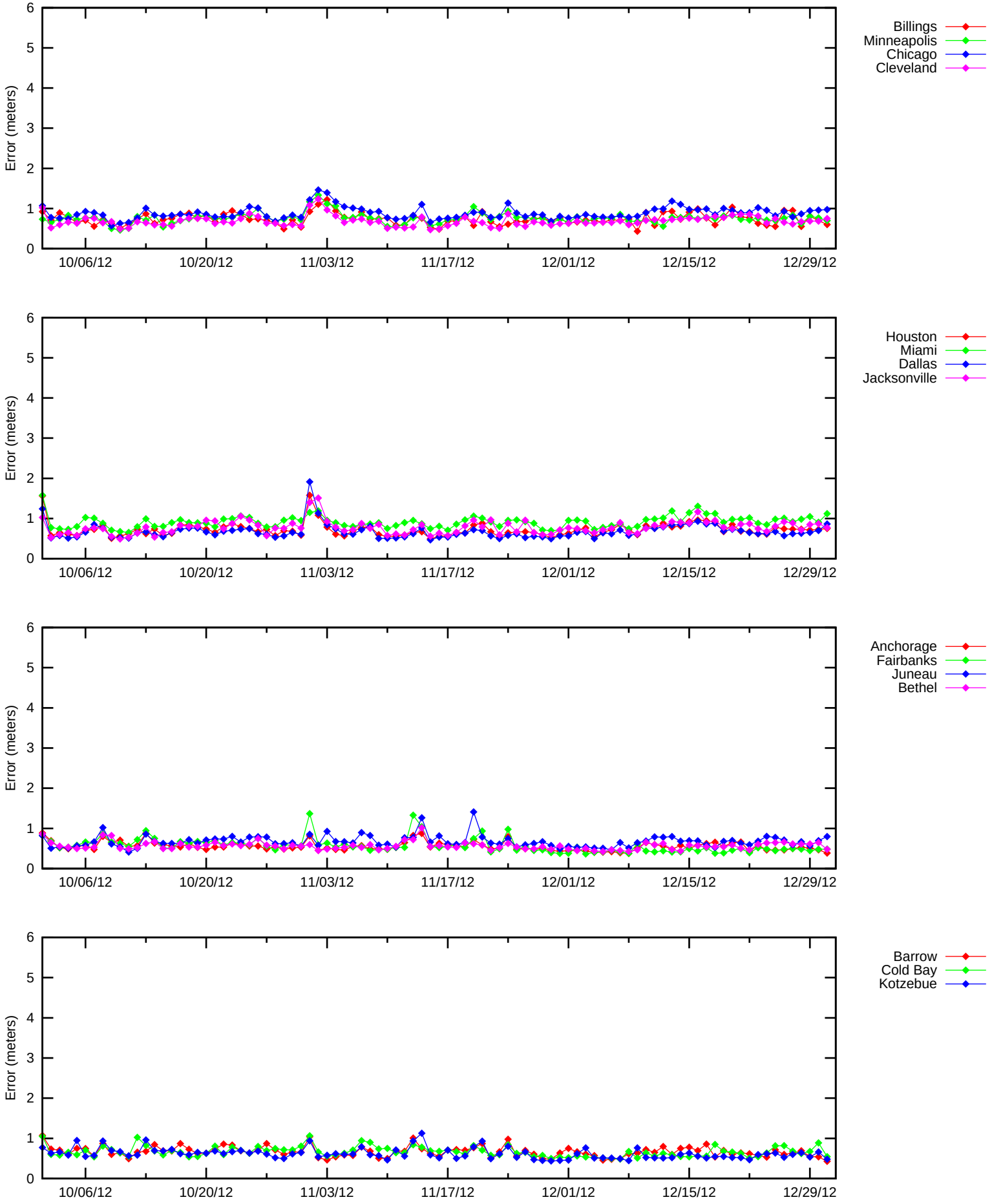


Figure 2-3 LPV 95% Horizontal Accuracy

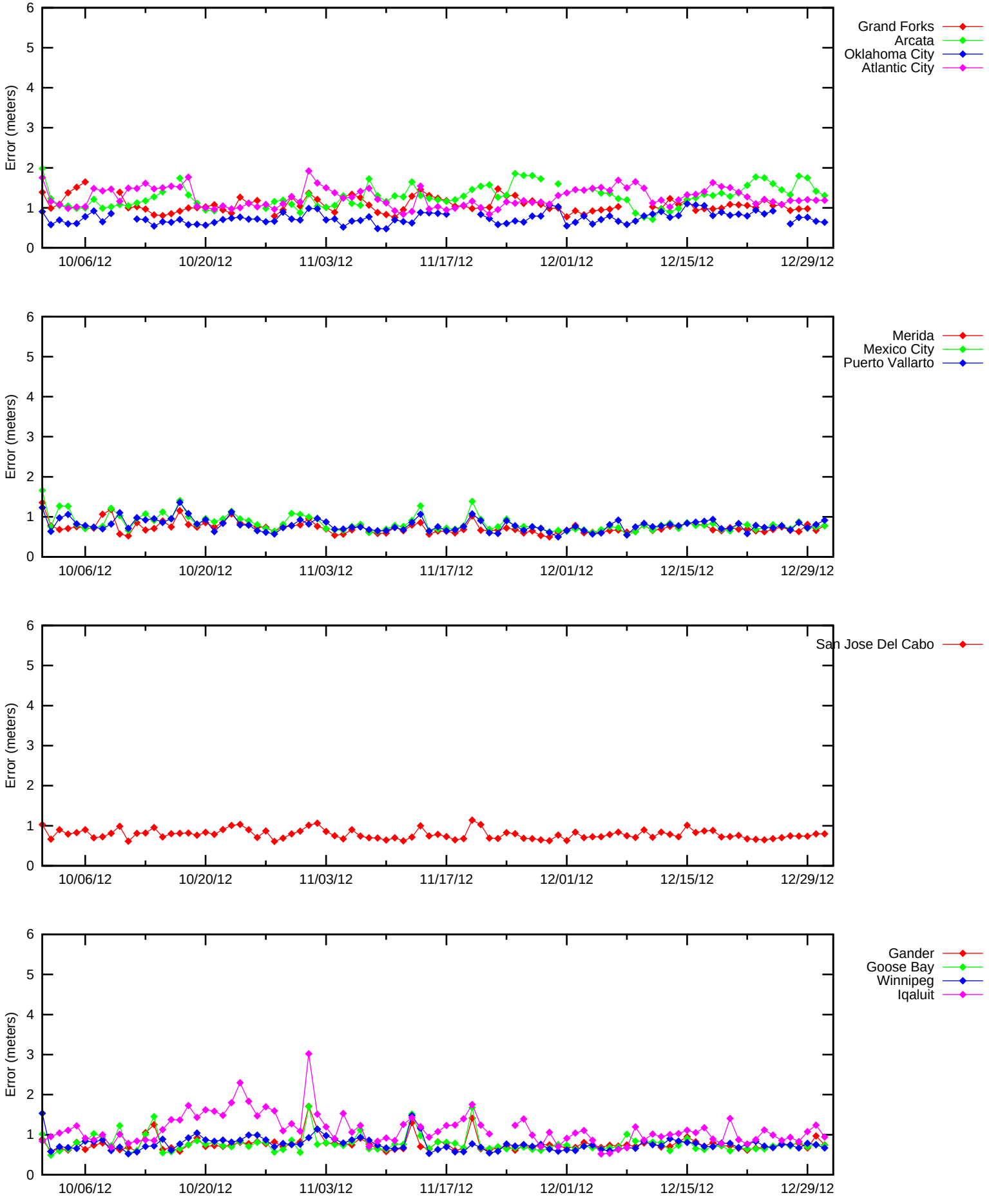


Figure 2-4 LPV 95% Vertical Accuracy

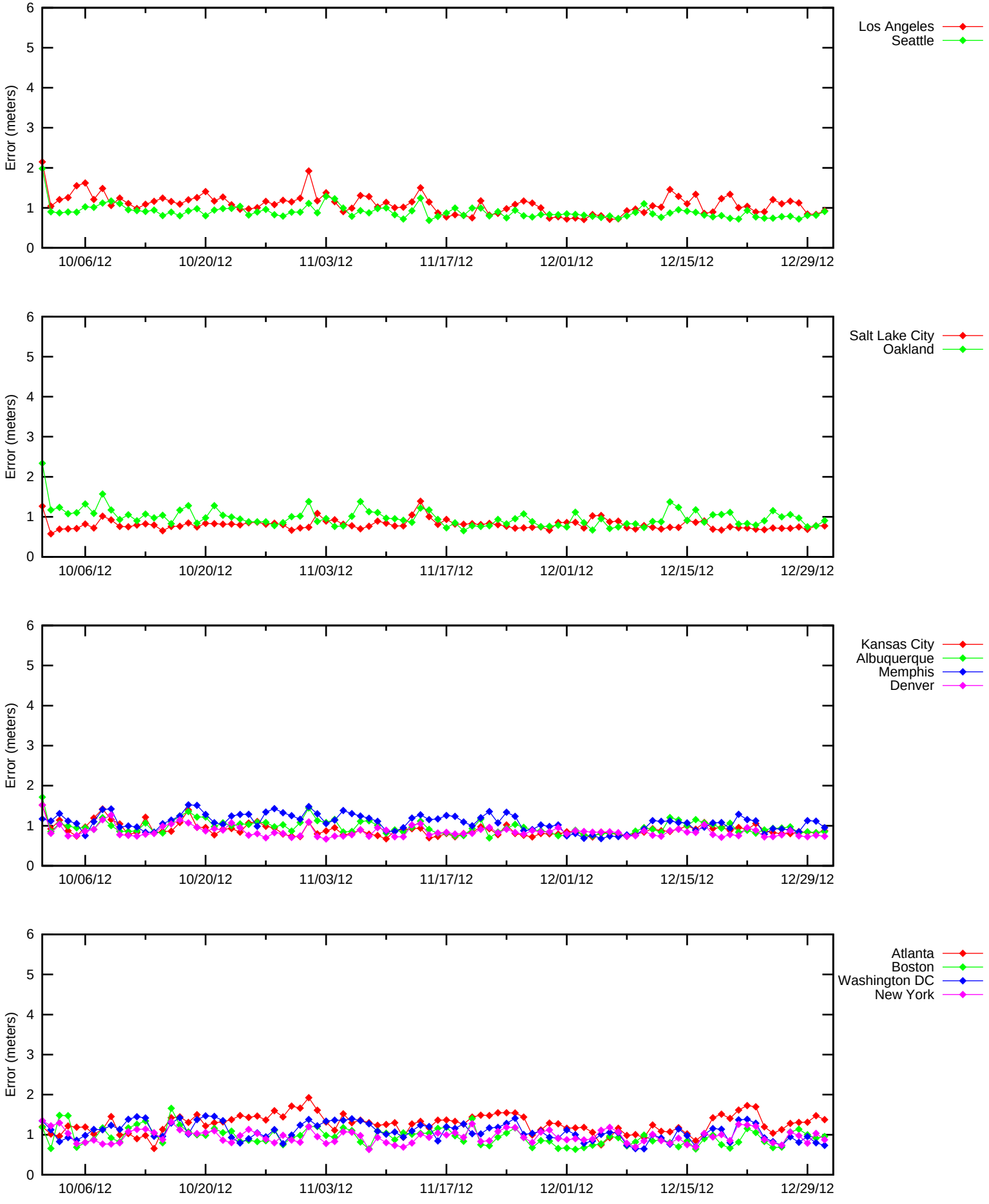


Figure 2-5 LPV 95% Vertical Accuracy

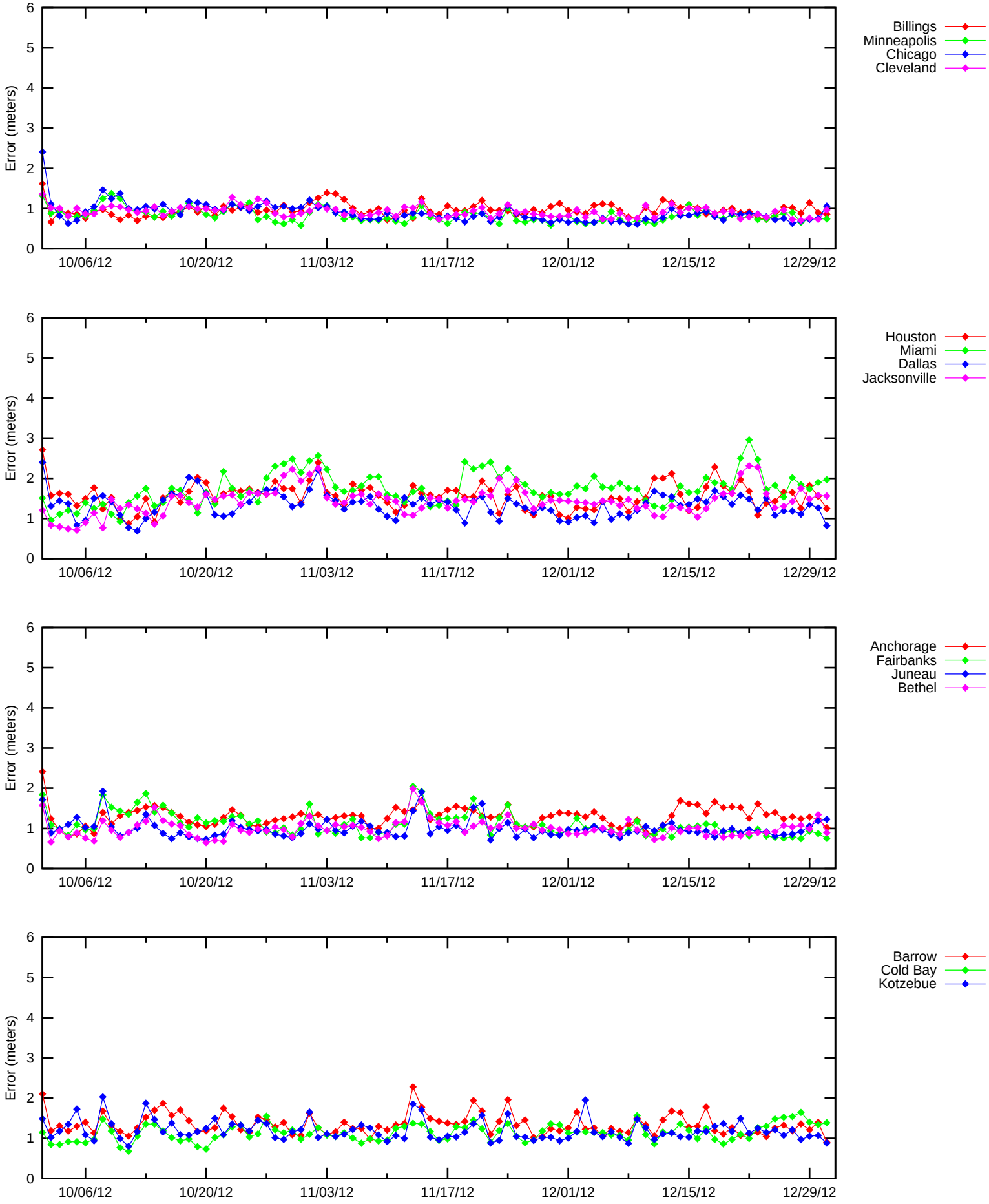


Figure 2-6 LPV 95% Vertical Accuracy

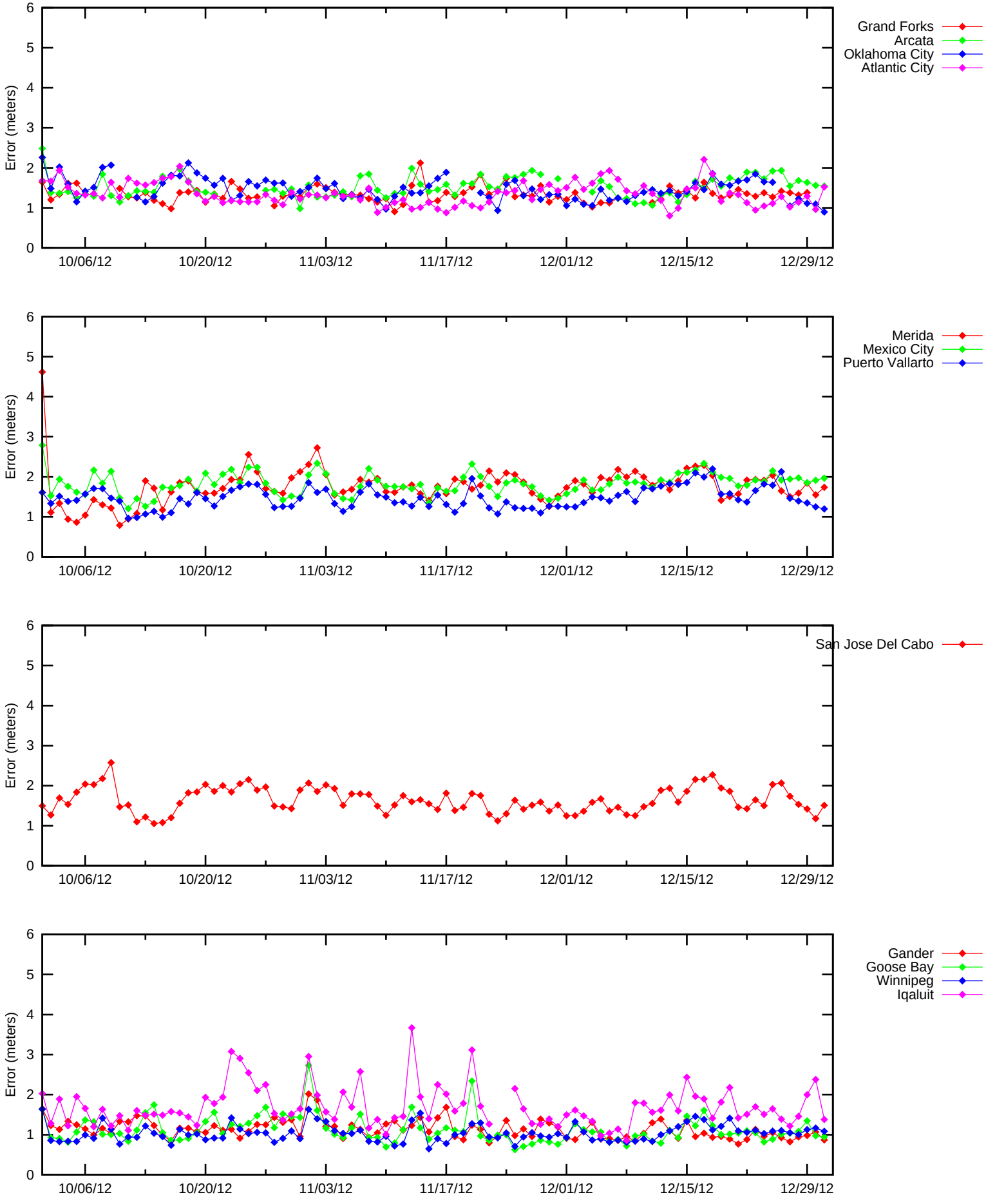


Figure 2-7 NPA 95% Horizontal Accuracy

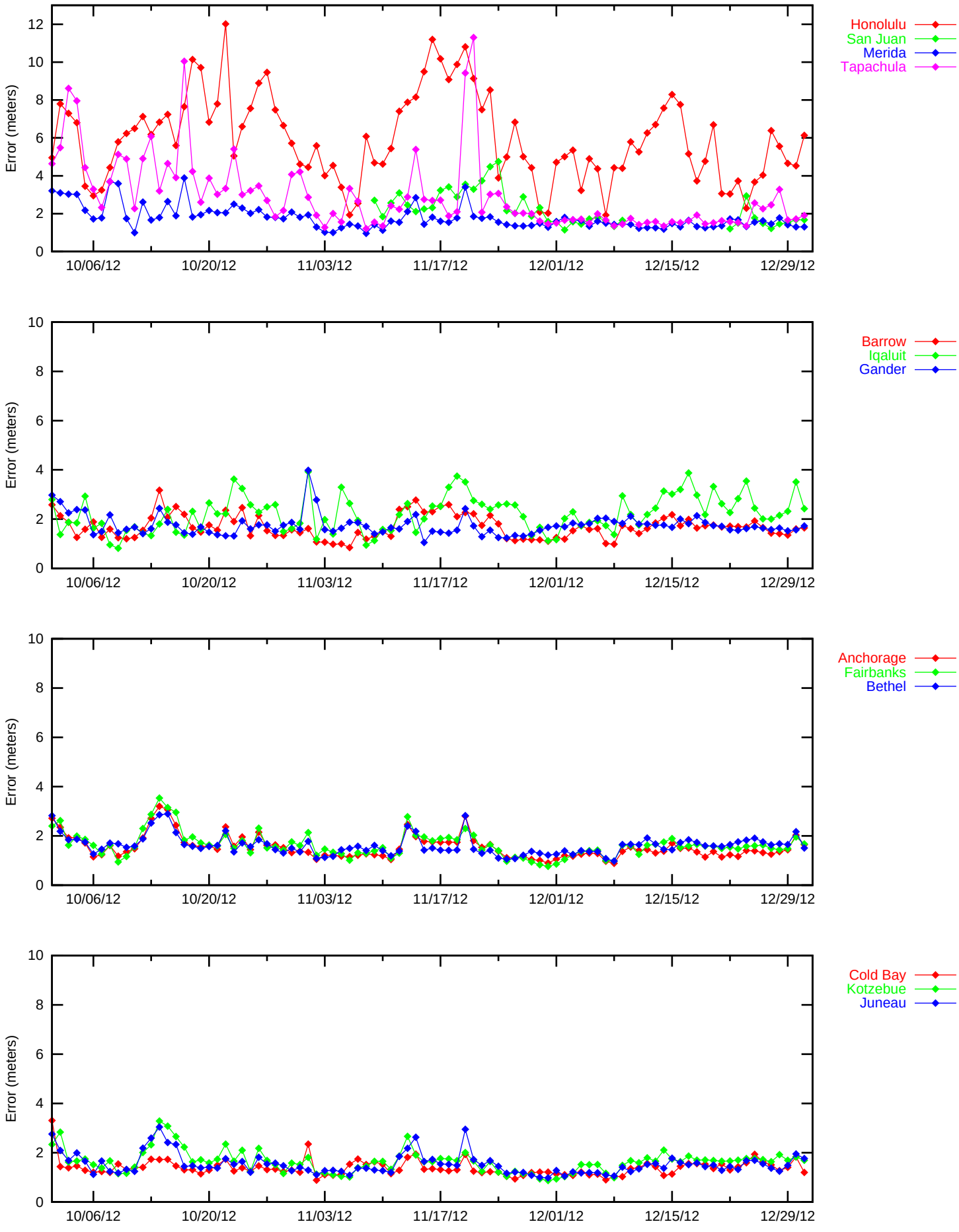


Figure 2-8 NPA 95% Horizontal Accuracy

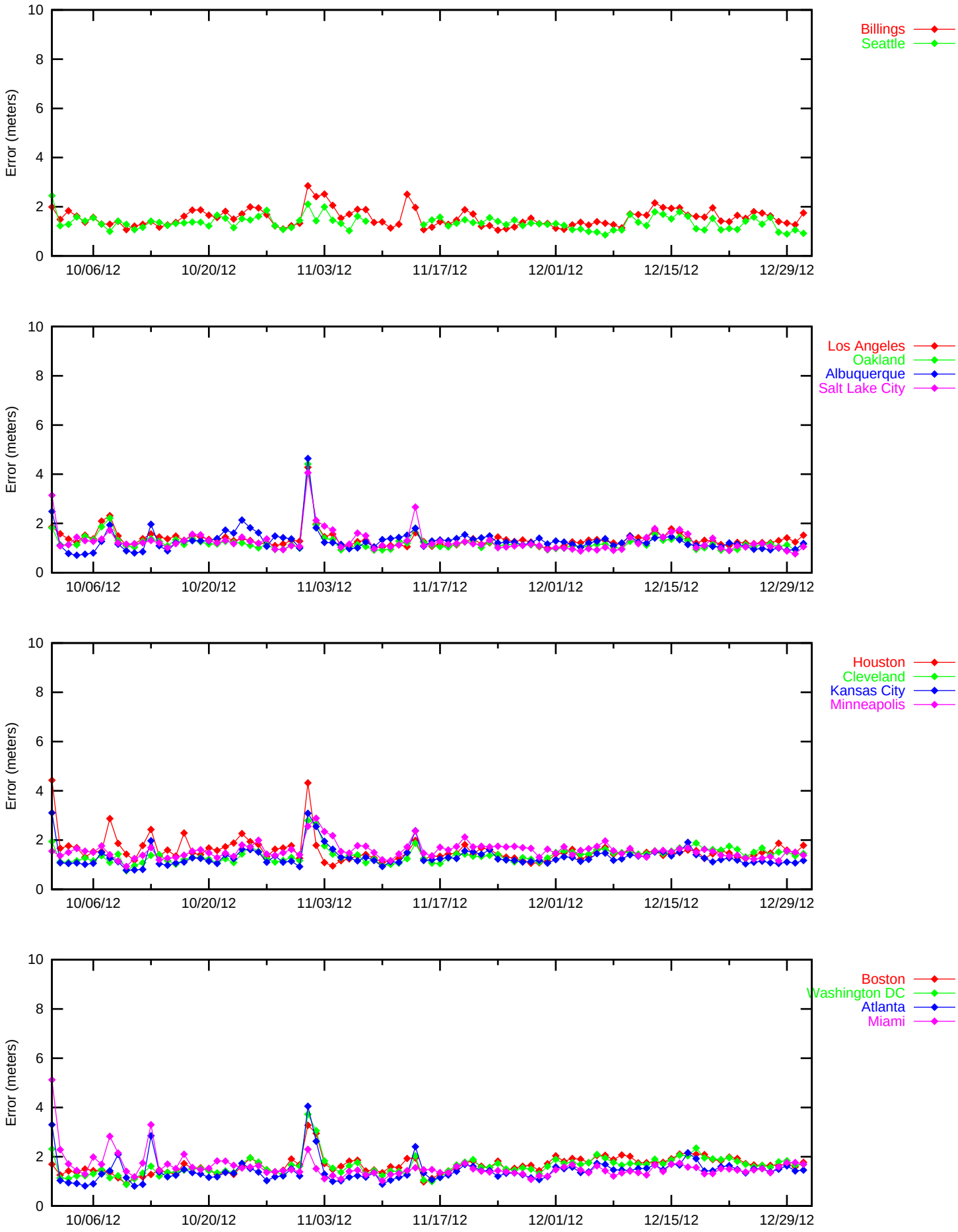


Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

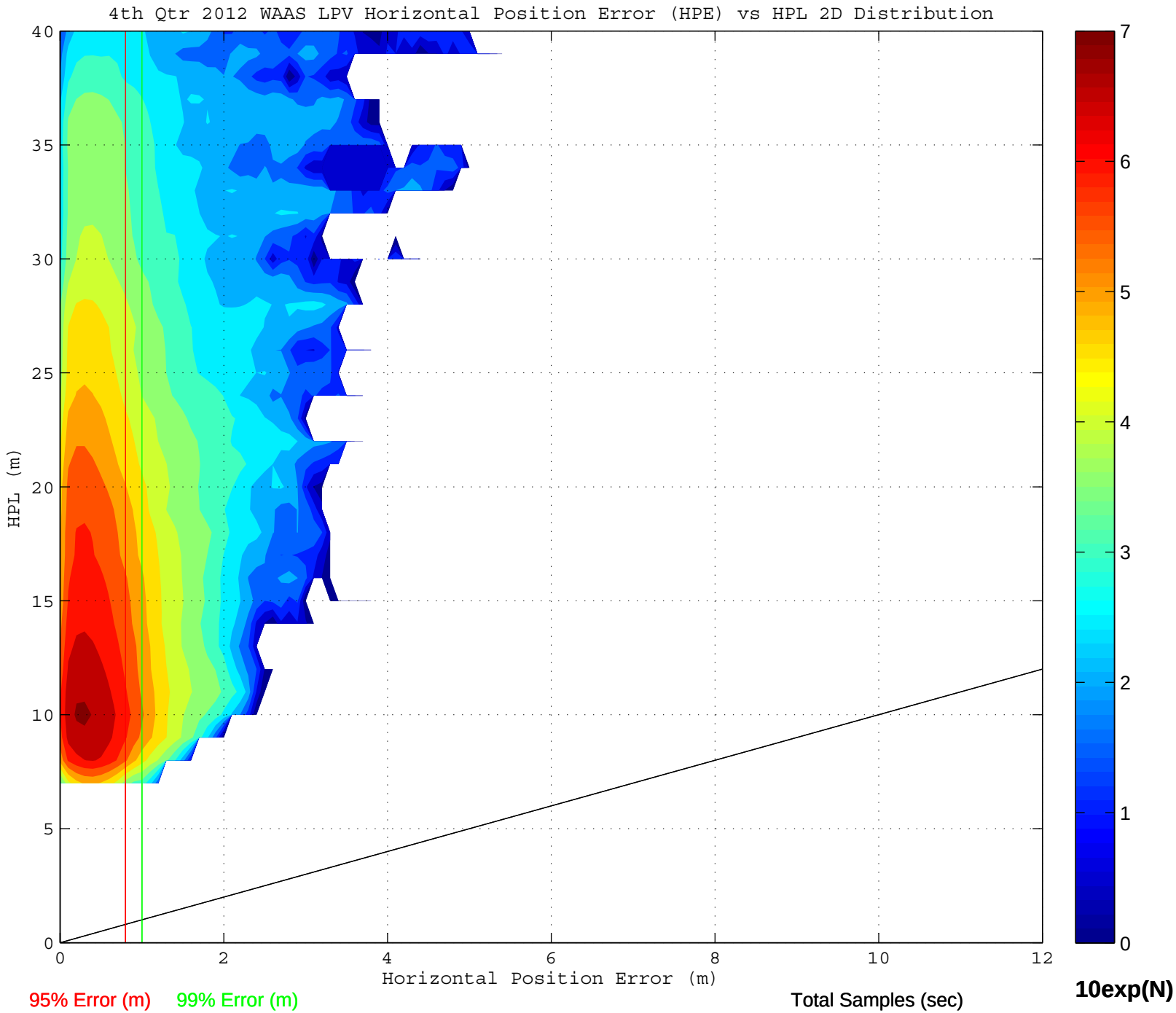


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

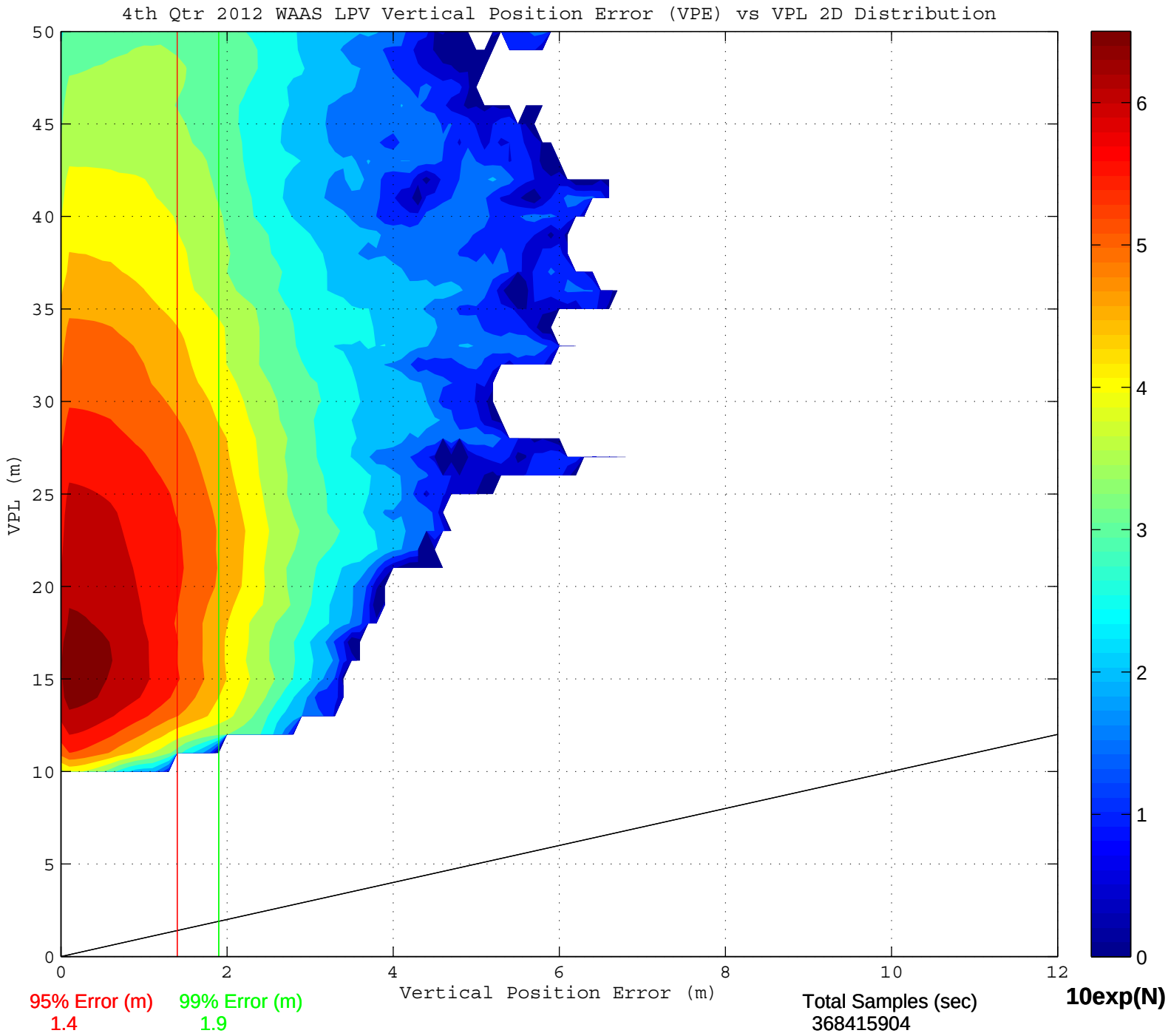


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

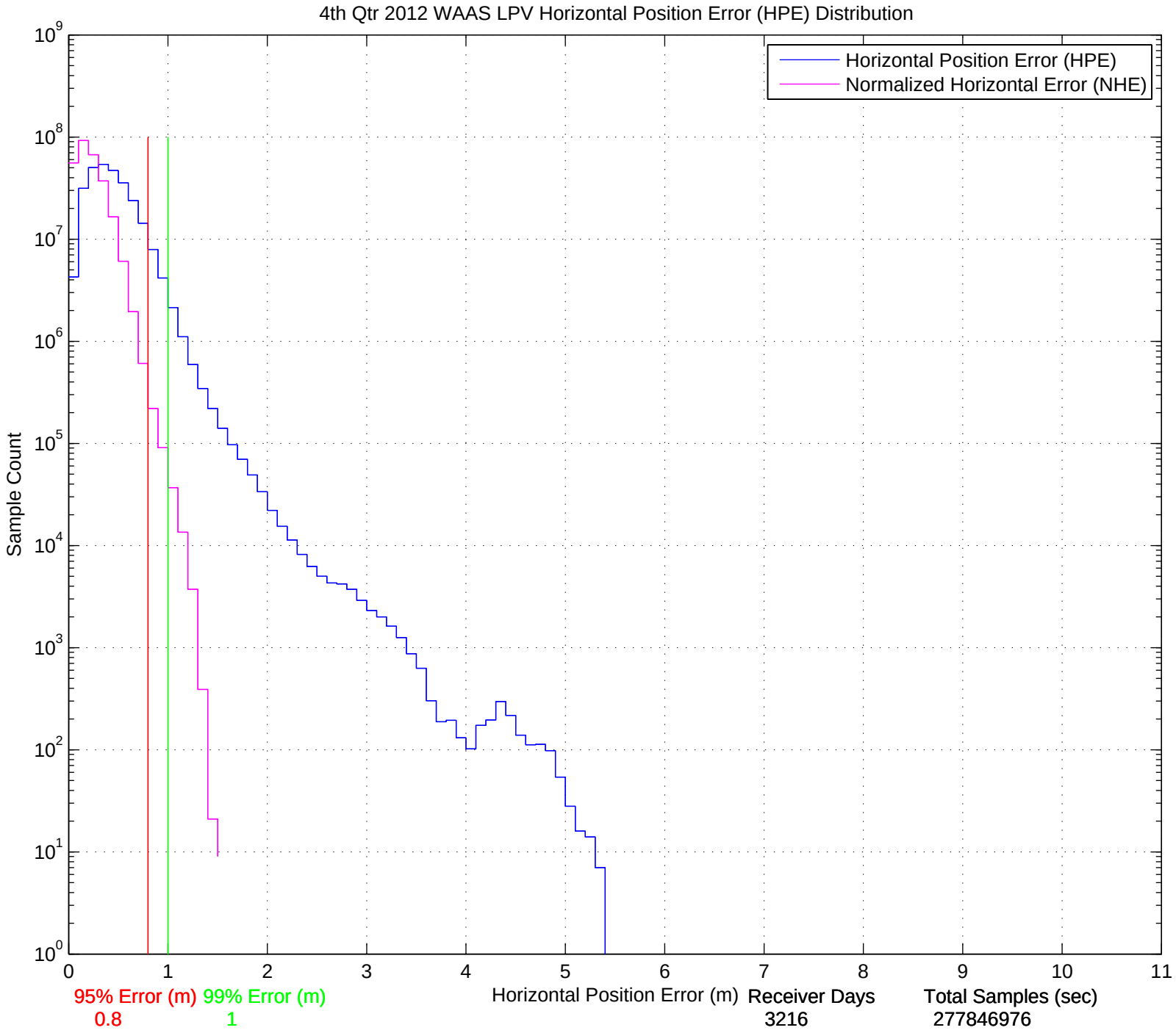
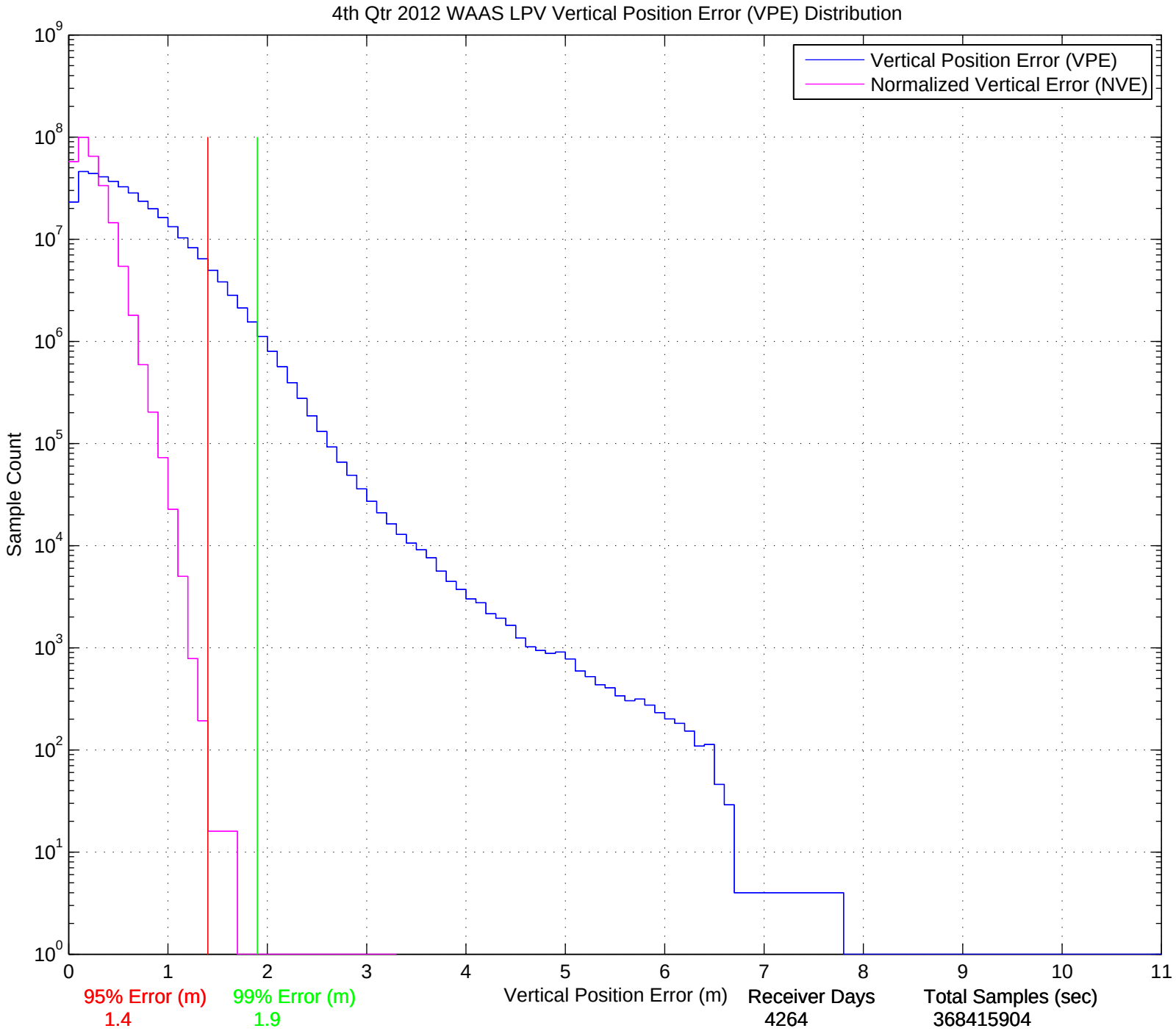


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



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 19.44 meters at Miami and 35.07 meters, at Arcata, respectively. The minimum 99% CONUS HPL and VPL are 10.71 meters at Denver and 18.01 meters at Chicago, respectively. The maximum 99% Alaska HPL and VPL are 29.26 meters and 38.56 meters, both at Cold Bay, respectively. The minimum 99% Alaska HPL and VPL are 13.73 meters at Fairbanks and 22.78 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, GUS switchovers, geomagnetic activity, and elevated GIVE and UDRE values. Please refer to Table 1-5 for the events that affected availability.

Change in the satellite geometry increased CONUS availability. Decline in geomagnetic activities was observed throughout the transition from equinox to solstice, which increased Canada and Mexico availability.

Manual GUS switchover on October 5th, November 13th, and December 13th elevated UDRE values and reduced Alaska PA availability. GUS faults caused missed navigation messages on November 23rd and December 8th which elevated UDRE values and reduced Alaska availability.

Geomagnetic activity on October 1st and November 1st elevated GIVE values and reduced CONUS, Alaska, and Canada availability. Geomagnetic activity on November 13th, 14th and November 24th caused loss of availability in Alaska and Canada. Geomagnetic activity on October 14th and November 20th affected mainly Canada availability. Geomagnetic activity on October 8th and October 9th slightly reduced Alaska and Canada availability and briefly elevated vertical position errors at Fairbanks; see DR 111 Vertical Position Errors Increased at Fairbanks due to Ionospheric Scintillation.

SV alert on PRN 21 on October 20th slightly reduced Canada availability.

Planned maintenance on PRN 1 on October 26th slightly affected Canada availability. Planned maintenance on PRN 23 on November 13th reduced CONUS, Alaska and Canada availability. Planned maintenance on PRN 32 on November 21st affected CONUS, Alaska and Canada availability. Planned Maintenance on PRN 2 on November 28th decreased Alaska and Mexico availability. Planned maintenance on PRN 30 on December 12th slightly reduced Alaska availability.

Radio frequency interference (RFI) caused localized loss of LPV200 availability at Washington DC and Boston but had no effect on WAAS service. RFI events at Iqaluit caused localized loss of LPV and LPV200 availability and slightly decreased PA availability; see DR 112 RFI at Iqaluit caused Loss of Satellite Tracking.

Table 3-1 99% Protection Level

Location	99% HPL (meters)	99% VPL (meters)	Percentage in PA mode
Arcata	15.669	35.071	100
Atlantic City	14.840	22.823	100
Grand Forks	12.849	22.145	100
Oklahoma City	11.920	21.968	100
Albuquerque	12.343	24.914	100
Anchorage	14.529	23.913	100
Atlanta	12.386	19.781	100
Barrow	18.367	35.636	99.997280
Bethel	19.157	30.437	100
Billings	11.262	21.304	100
Boston	15.816	22.496	100
Chicago	11.674	18.011	100
Cleveland	12.539	18.933	100
Cold Bay	29.285	38.558	100
Dallas	12.280	22.382	100
Denver	10.712	21.603	100
Fairbanks	13.736	24.537	100
Gander	26.956	39.230	100
Goose Bay	20.851	29.081	100
Houston	11.799	23.816	100
Iqaluit	30.703	43.012	99.999920
Jacksonville	14.246	21.613	100
Juneau	13.962	22.780	100
Kansas City	11.359	18.695	100
Kotzebue	16.718	32.910	99.999850
Los Angeles	14.673	27.812	100
Memphis	11.423	19.079	100
Merida	20.851	33.196	100
Mexico City	31.220	40.763	100
Miami	19.447	29.816	100
Minneapolis	11.498	20.754	100
New York	15.327	22.414	100
Oakland	17.193	34.254	100
Puerto Vallarta	33.903	46.937	100
Salt Lake City	11.558	21.508	100
San Jose Del Cabo	28.692	44.645	100
Seattle	14.309	26.933	100
Washington DC	13.132	20.442	100
Winnipeg	13.177	22.087	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	0.999925	0.978681
Atlantic City	1	1	0.997043
Elko	1	0.999911	0.999651
Grand Forks	1	0.999930	0.999909
Oklahoma City	1	1	1
Prescott	1	1	0.999815
Albuquerque	1	1	0.999954
Anchorage	0.999077	0.999045	0.998356
Atlanta	1	1	1
Bangor	0.999974	0.999974	0.997341
Barrow	0.997877	0.997367	0.986222
Bethel	0.999242	0.999151	0.998628
Billings	1	1	1
Boston	1	0.999992	0.999978
Chicago	1	1	1
Cleveland	1	1	1
Cold Bay	0.999605	0.999469	0.946670
Dallas	1	1	1
Denver	1	1	1
Fairbanks	0.998952	0.998307	0.997327
Gander	1	0.999443	0.947797
Goose Bay	0.999913	0.999905	0.999505
Honolulu	0	0	0
Houston	1	1	1
Iqaluit	0.997707	0.995061	0.938606
Jacksonville	1	1	1
Juneau	0.998992	0.998648	0.998049
Kansas City	1	1	1
Kotzebue	0.998241	0.997884	0.992226
Los Angeles	1	1	0.999874
Memphis	1	1	1
Merida	0.999493	0.999493	0.997834
Mexico City	0.999912	0.997810	0.948601
Miami	1	1	0.999420
Minneapolis	1	1	0.999985
New York	1	1	1
Oakland	1	0.999799	0.987335
Puerto Vallarta	0.999819	0.997839	0.905859
Salt Lake City	1	1	1
San Jose Del Cabo	0.999895	0.997372	0.940001
San Juan	0.021497	0	0
Seattle	1	1	0.999866
Tapachula	0.011590	0.011533	0.008792
Washington DC	1	1	0.999992
Winnipeg	1	0.999927	0.999712

Table 3-3 NPA Availability

Location	NPA Availability (Excluding RAIM/FDE)
Albuquerque	1
Anchorage	1
Atlanta	1
Barrow	1
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	1
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

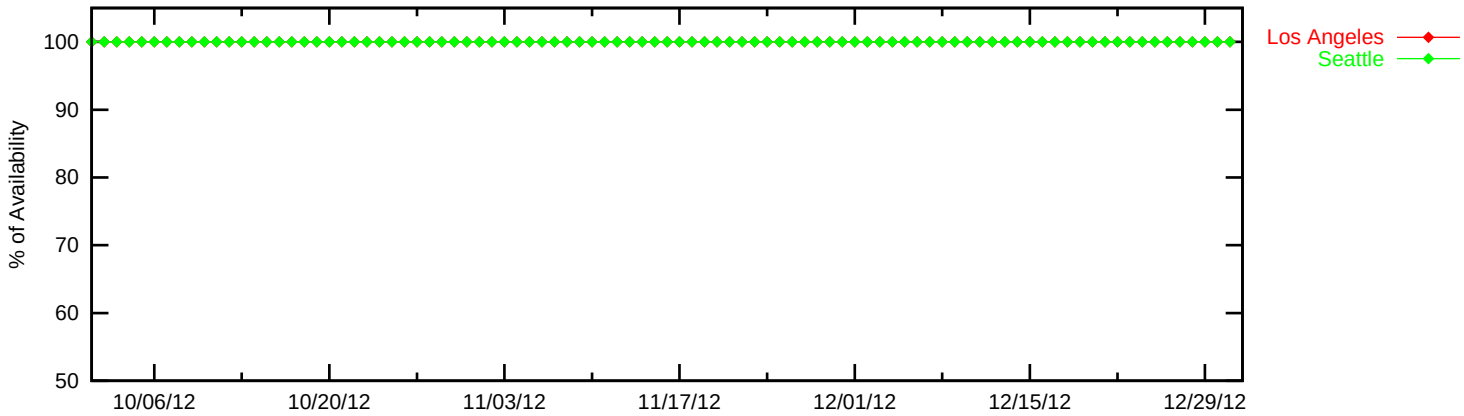
Table 3-4 LPV and LPV 200 Outage Rate (Per 150 sec approach)

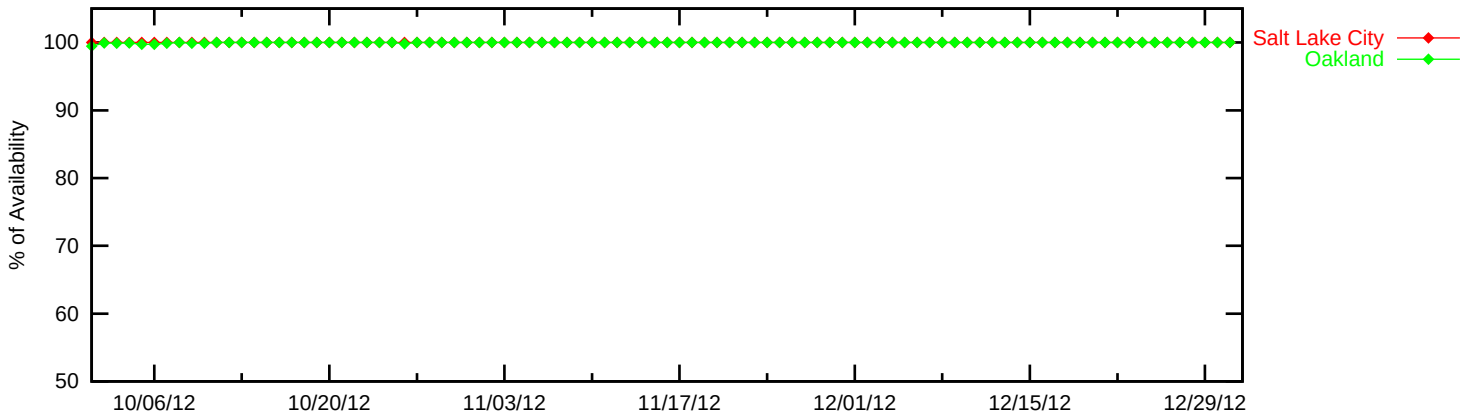
Location	LP Outages	LP Outage Rates	LPV Outages	LPV Outage Rates	LPV 200 Outages	LPV 200 Outage Rates
Arcata	0	0	3	0.000064	93	0.002025
Atlantic City	0	0	0	0	47	0.000299
Elko	0	0	10	0.000202	29	0.000587
Grand Forks	0	0	1	0.000021	1	0.000021
Oklahoma City	0	0	0	0	0	0
Prescott	0	0	0	0	2	0.000038
Albuquerque	0	0	0	0	1	0.000019
Anchorage	1	0.000019	2	0.000038	8	0.000151
Atlanta	0	0	0	0	0	0
Bangor	4	0.000080	4	0.000080	88	0.001765
Barrow	9	0.000170	13	0.000246	162	0.003100
Bethel	2	0.000038	2	0.000038	7	0.000132
Billings	0	0	0	0	0	0
Boston	0	0	1	0.000019	3	0.000057
Chicago	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0
Cold Bay	1	0.000019	3	0.000057	356	0.007098
Dallas	0	0	0	0	0	0
Denver	0	0	0	0	0	0
Fairbanks	3	0.000057	4	0.000076	12	0.000227
Gander	0	0	18	0.000340	298	0.005934
Goose Bay	1	0.000019	2	0.000038	16	0.000302
Houston	0	0	0	0	0	0
Iqaluit	20	0.000387	49	0.000950	454	0.009335
Jacksonville	0	0	0	0	0	0
Juneau	1	0.000019	4	0.000076	6	0.000114
Kansas City	0	0	0	0	0	0
Kotzebue	8	0.000151	10	0.000189	64	0.001217
Los Angeles	0	0	0	0	3	0.000057
Memphis	0	0	0	0	0	0
Merida	2	0.000038	2	0.000038	31	0.000586
Mexico City	6	0.000113	76	0.001437	661	0.013151
Miami	0	0	0	0	25	0.000472
Minneapolis	0	0	0	0	1	0.000019
New York	0	0	0	0	0	0
Oakland	0	0	11	0.000208	99	0.001892
Puerto Vallarta	4	0.000076	42	0.000796	681	0.014213
Salt Lake City	0	0	0	0	0	0
San Jose Del Cabo	1	0.000019	120	0.002271	286	0.005743
Seattle	0	0	0	0	2	0.000038
Tapachula	183	0.299010	183	0.300506	162	0.348952
Washington DC	0	0	0	0	1	0.000019
Winnipeg	0	0	1	0.000019	1	0.000019

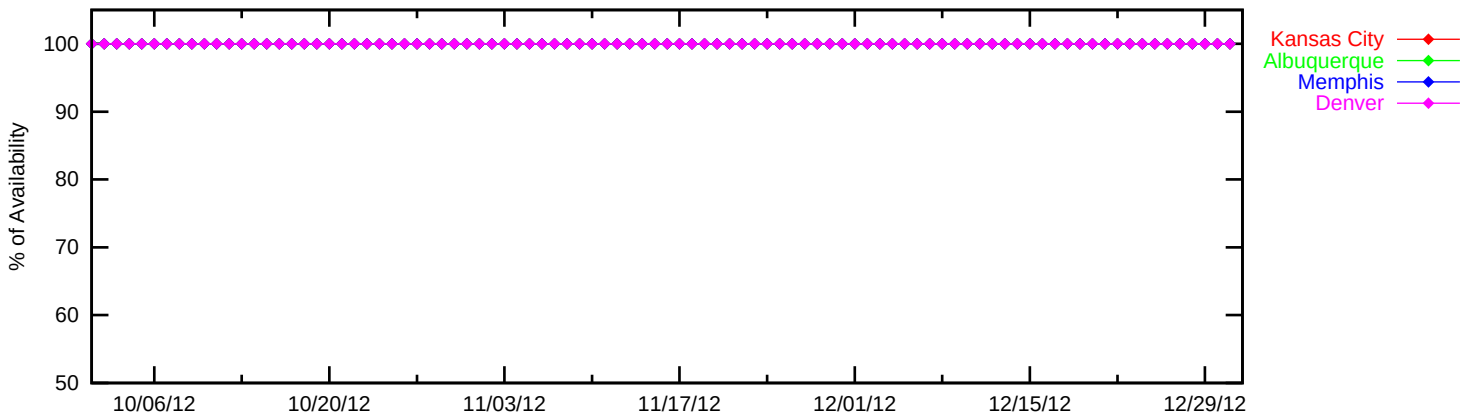
Table 3-5 NPA Outage Rates (Excluding FD/FDE)

Location	NPA Outages	NPA Outage Rate
Albuquerque	0	0
Anchorage	0	0
Atlanta	0	0
Barrow	0	0
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	0	0
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







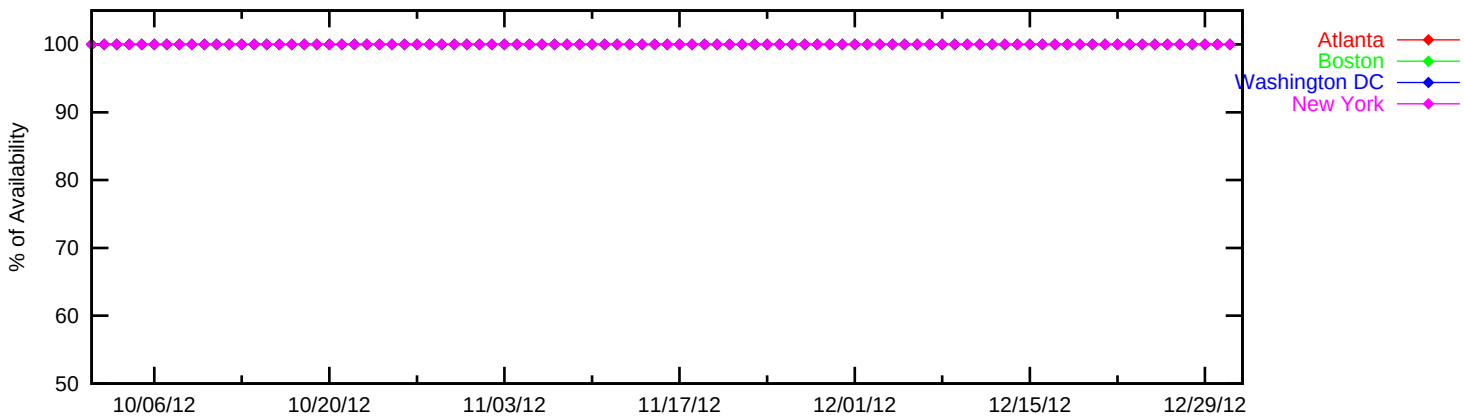


Figure 3-2 LPV Instantaneous Availability

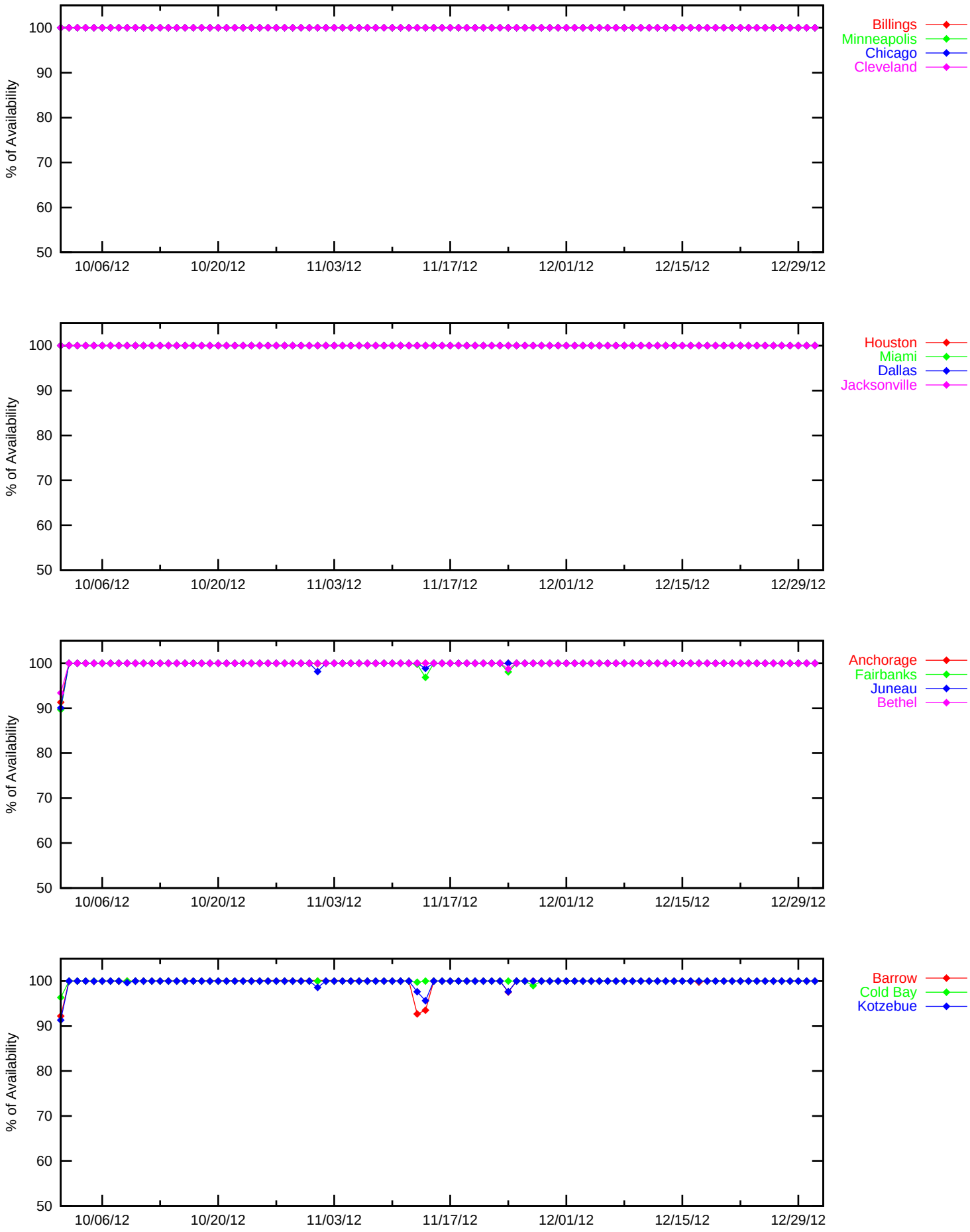
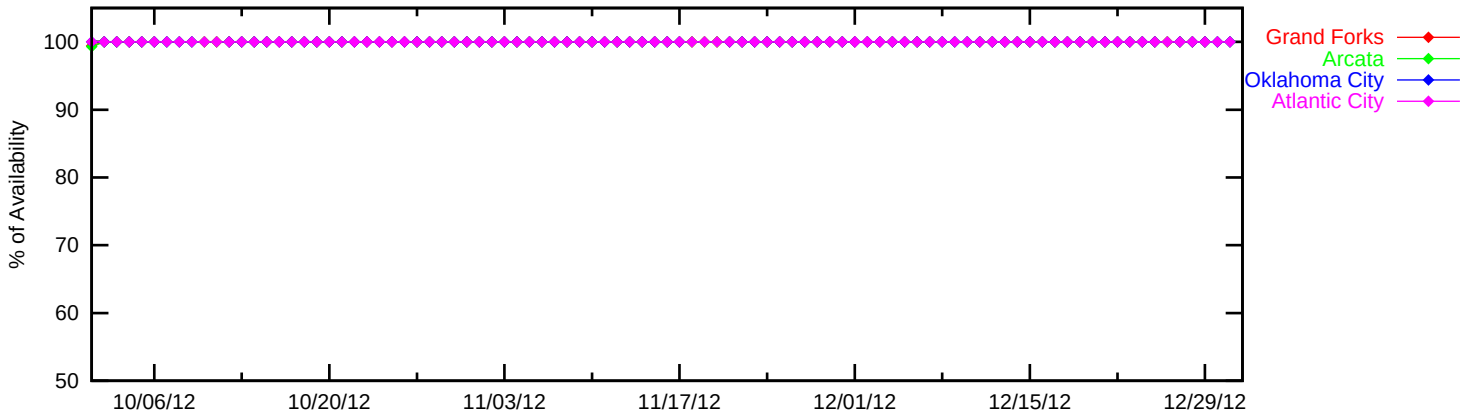
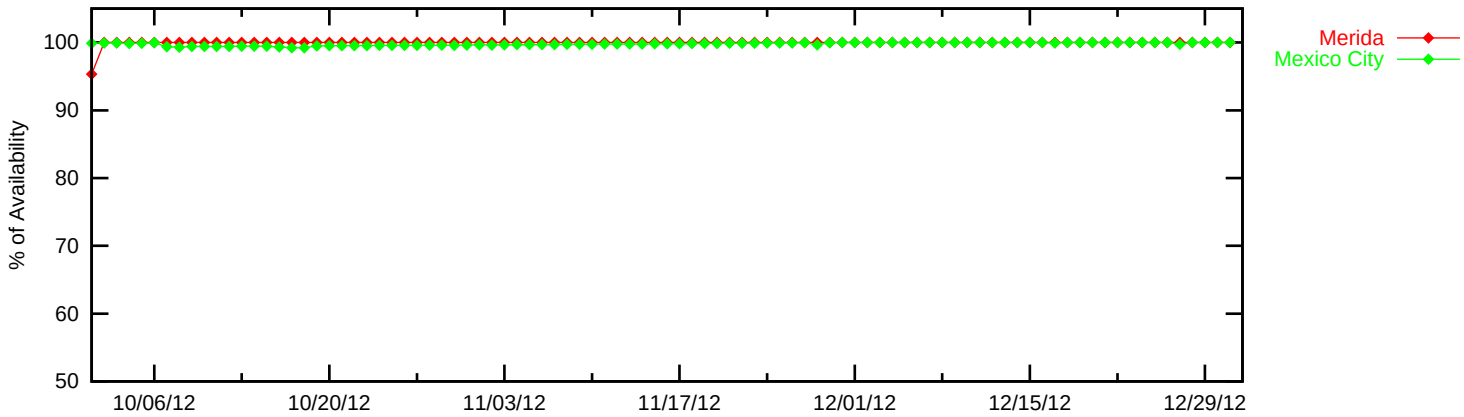
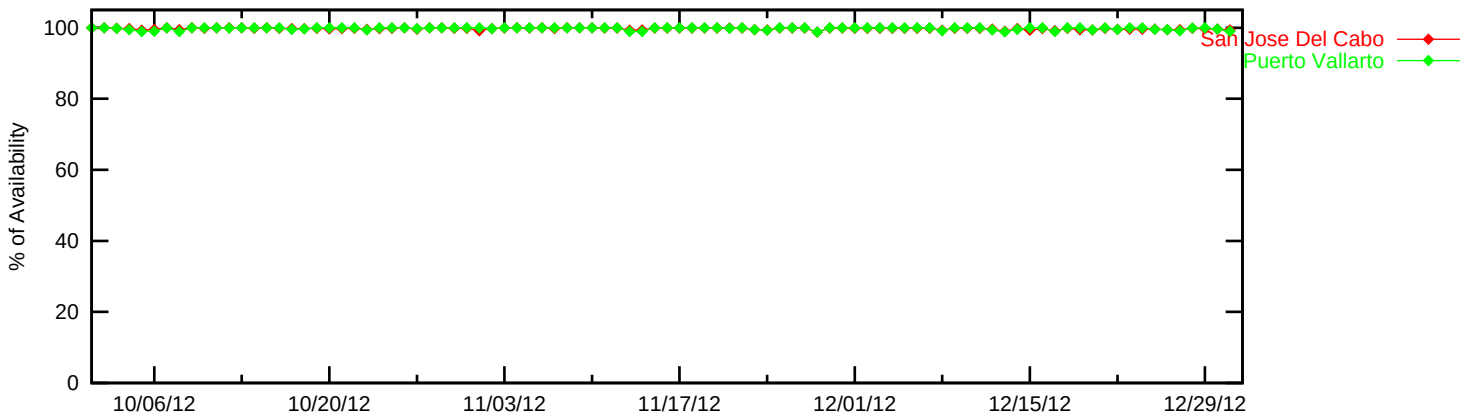


Figure 3-3 LPV Instantaneous Availability







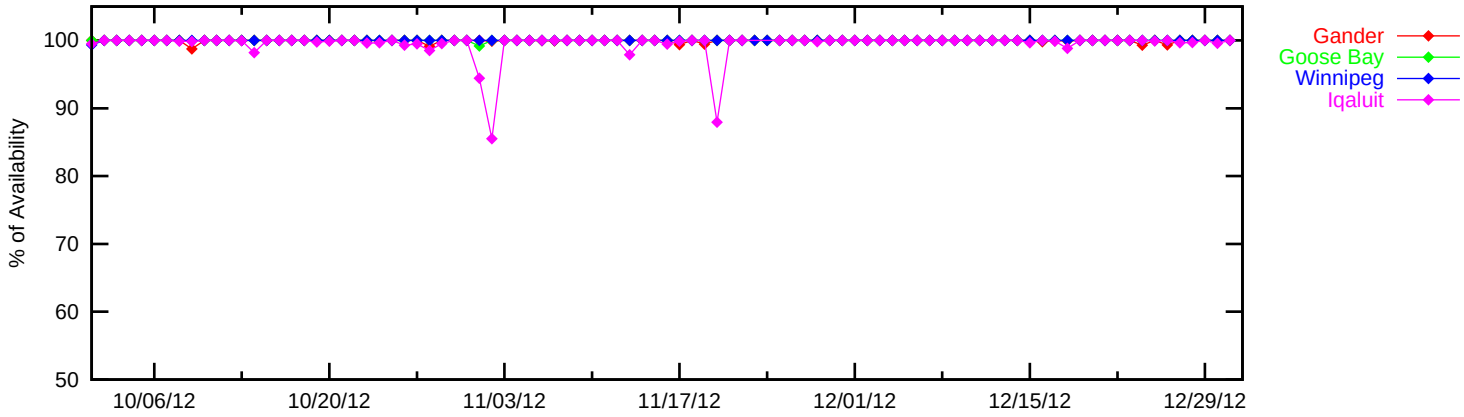
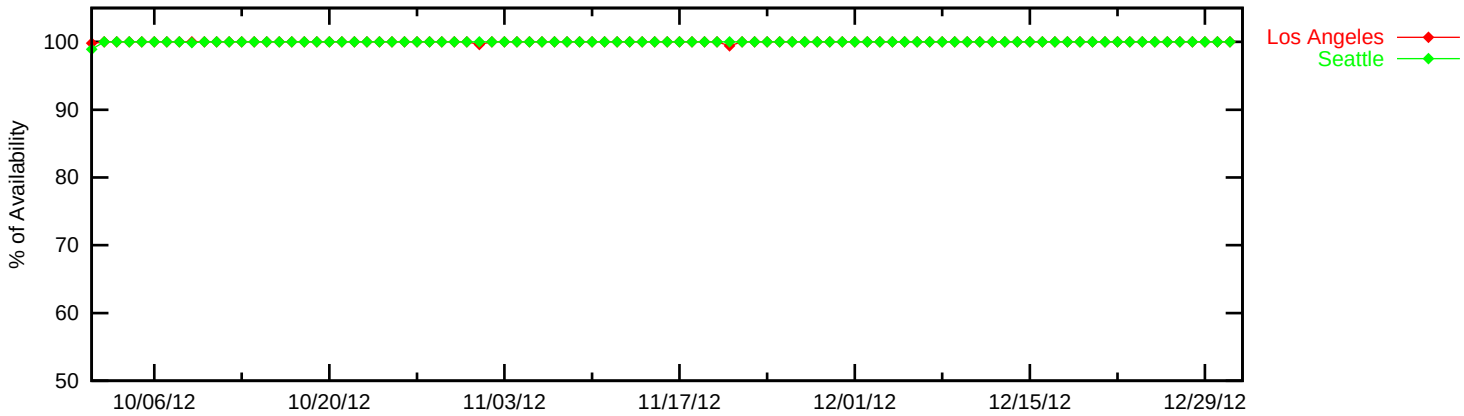
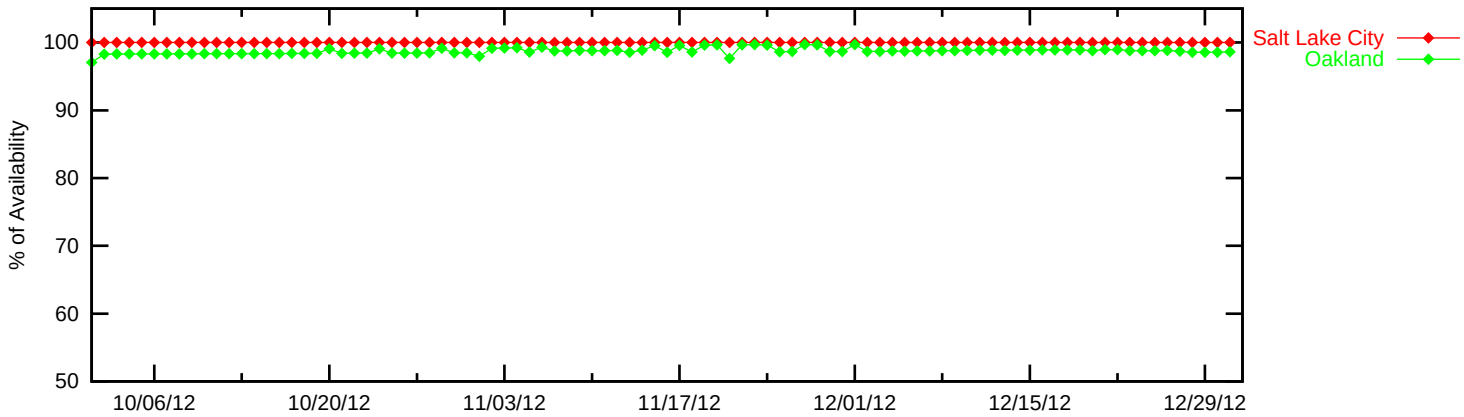
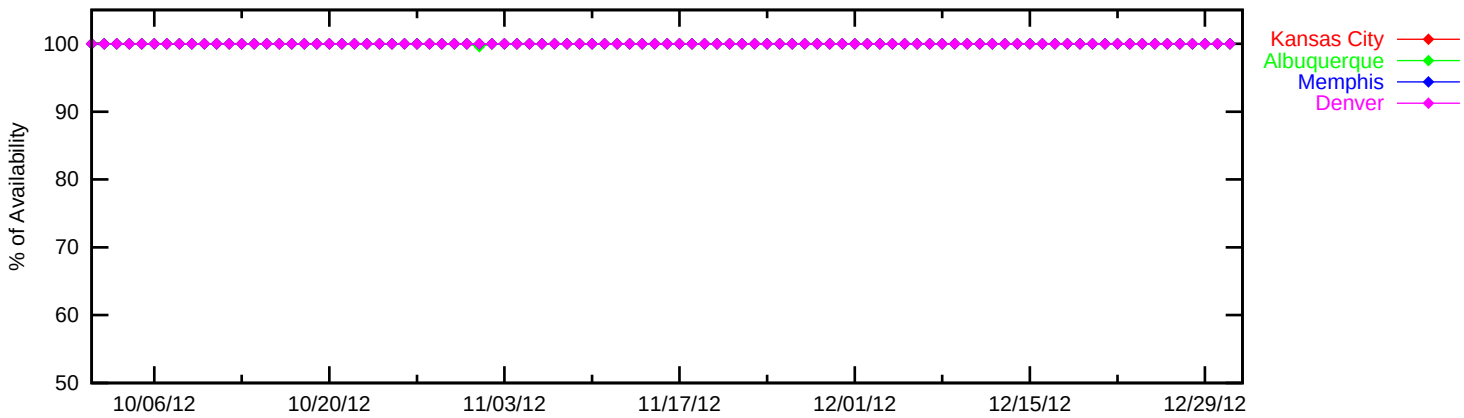


Figure 3-4 LPV 200 Instantaneous Availability







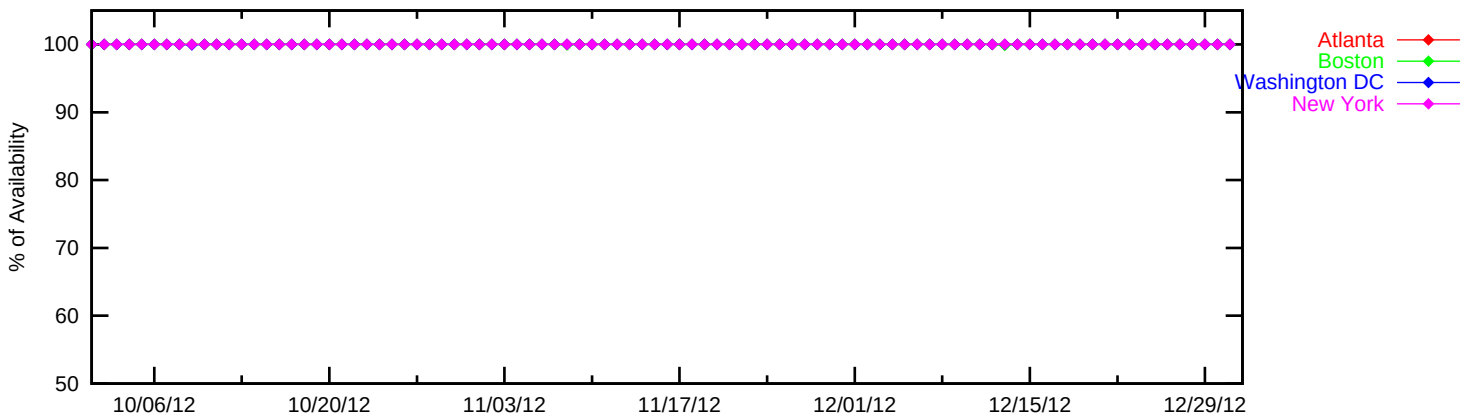


Figure 3-5 LPV 200 Instantaneous Availability

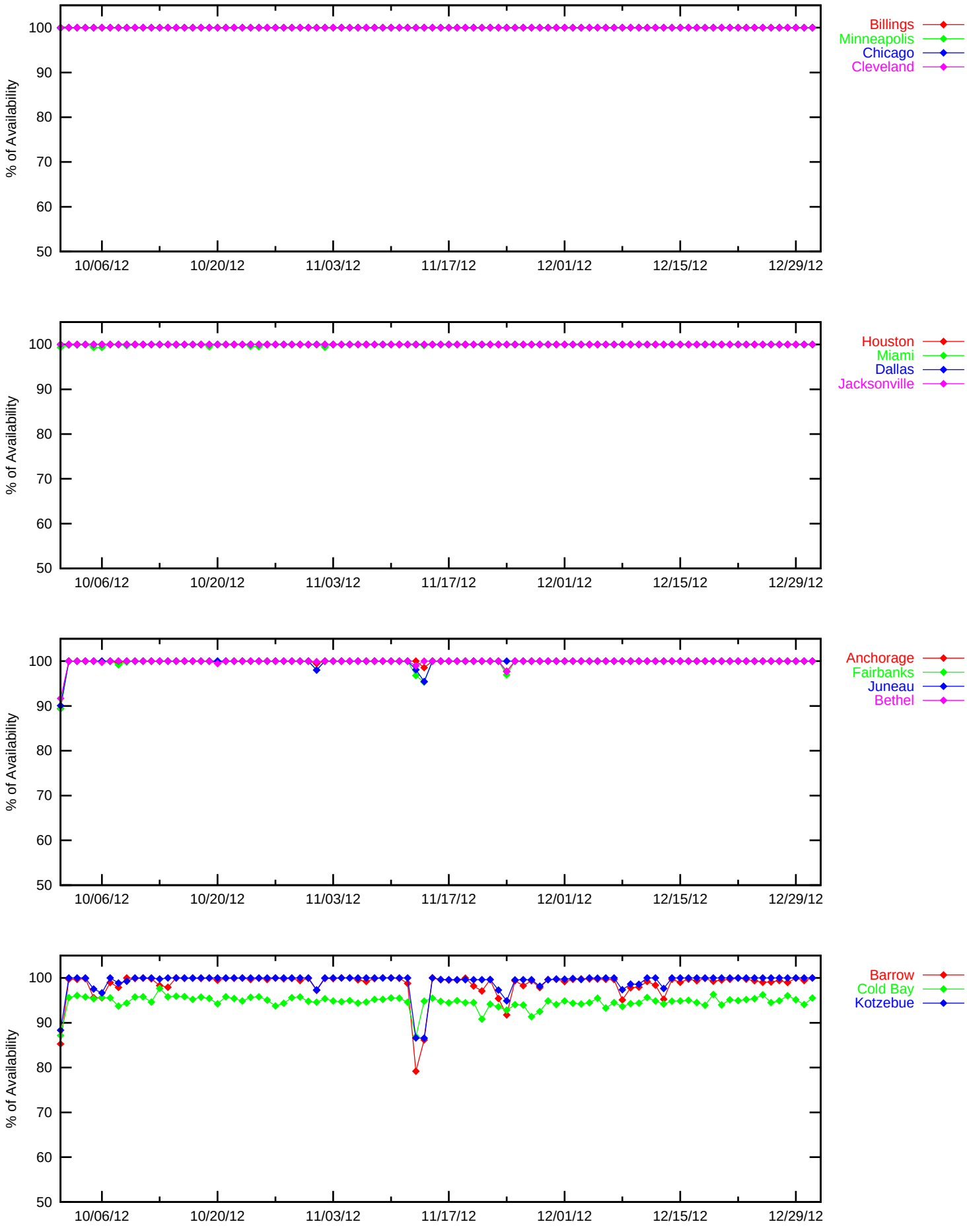
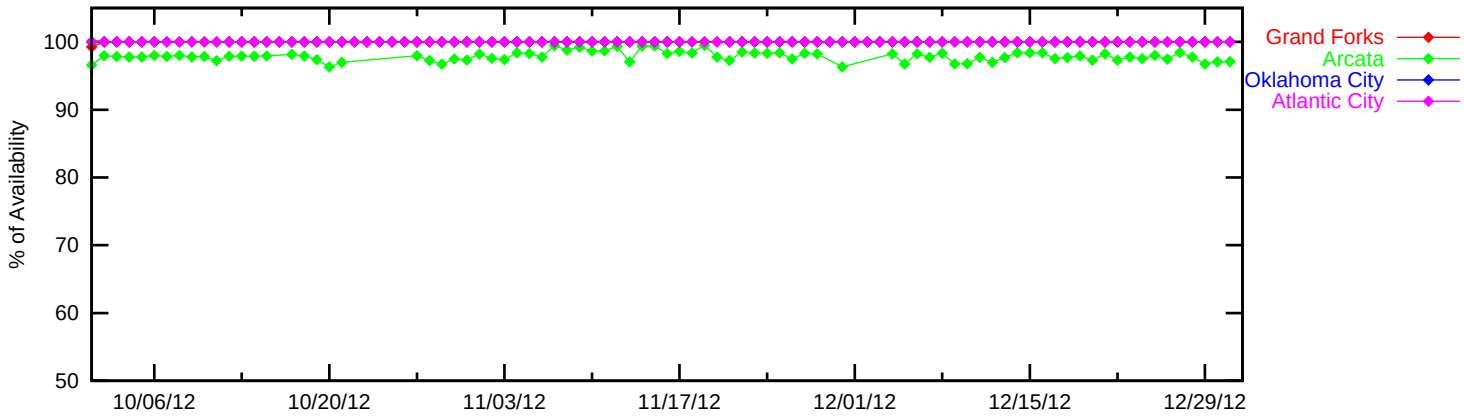
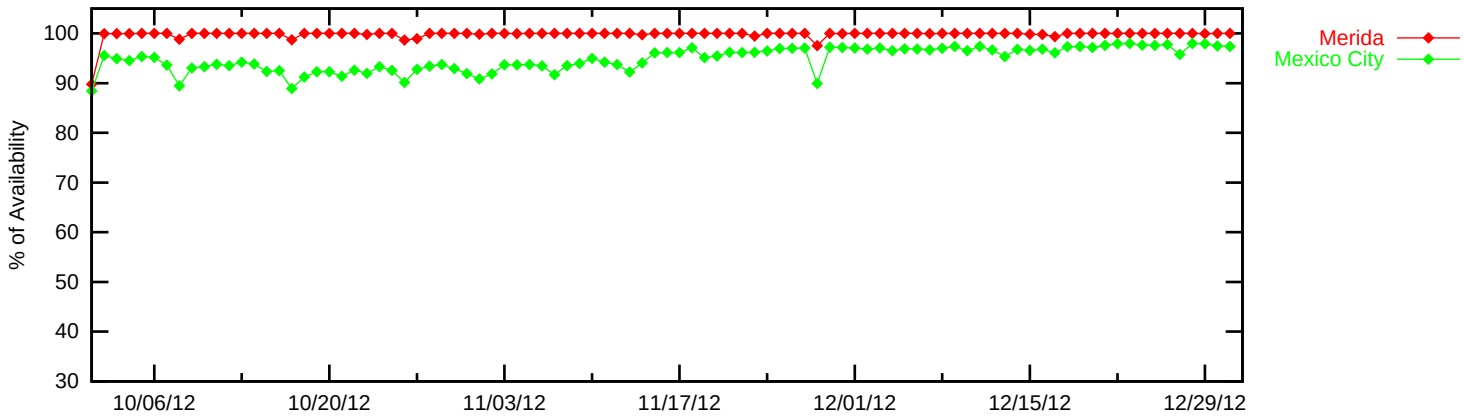
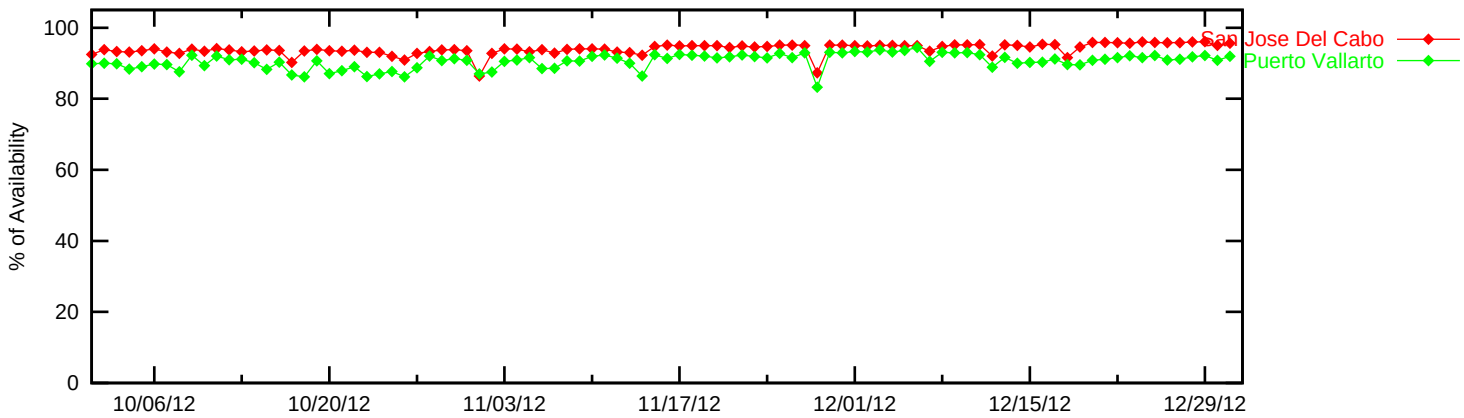


Figure 3-6 LPV 200 Instantaneous Availability







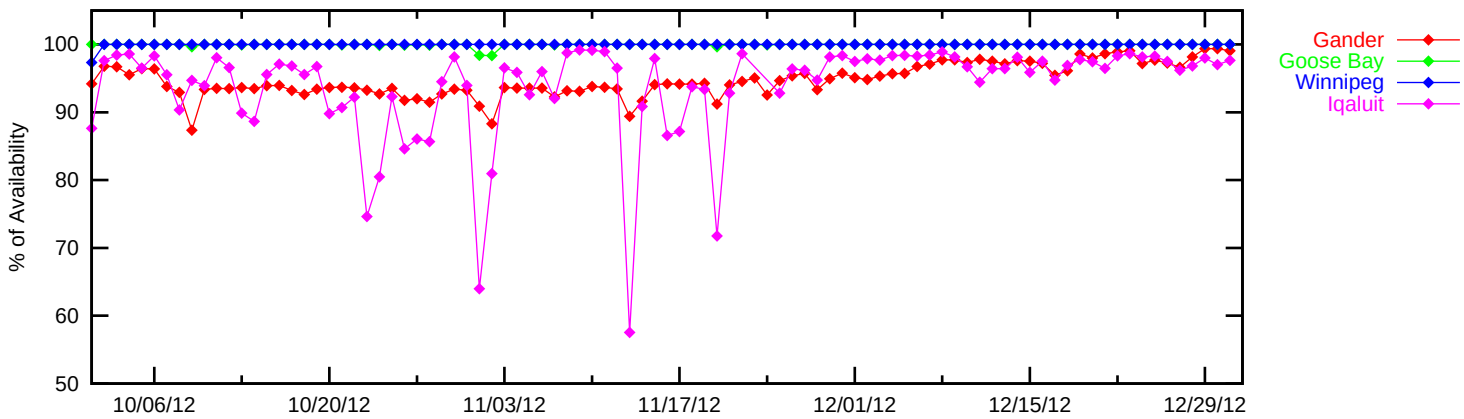


Figure 3-7 LPV Outages

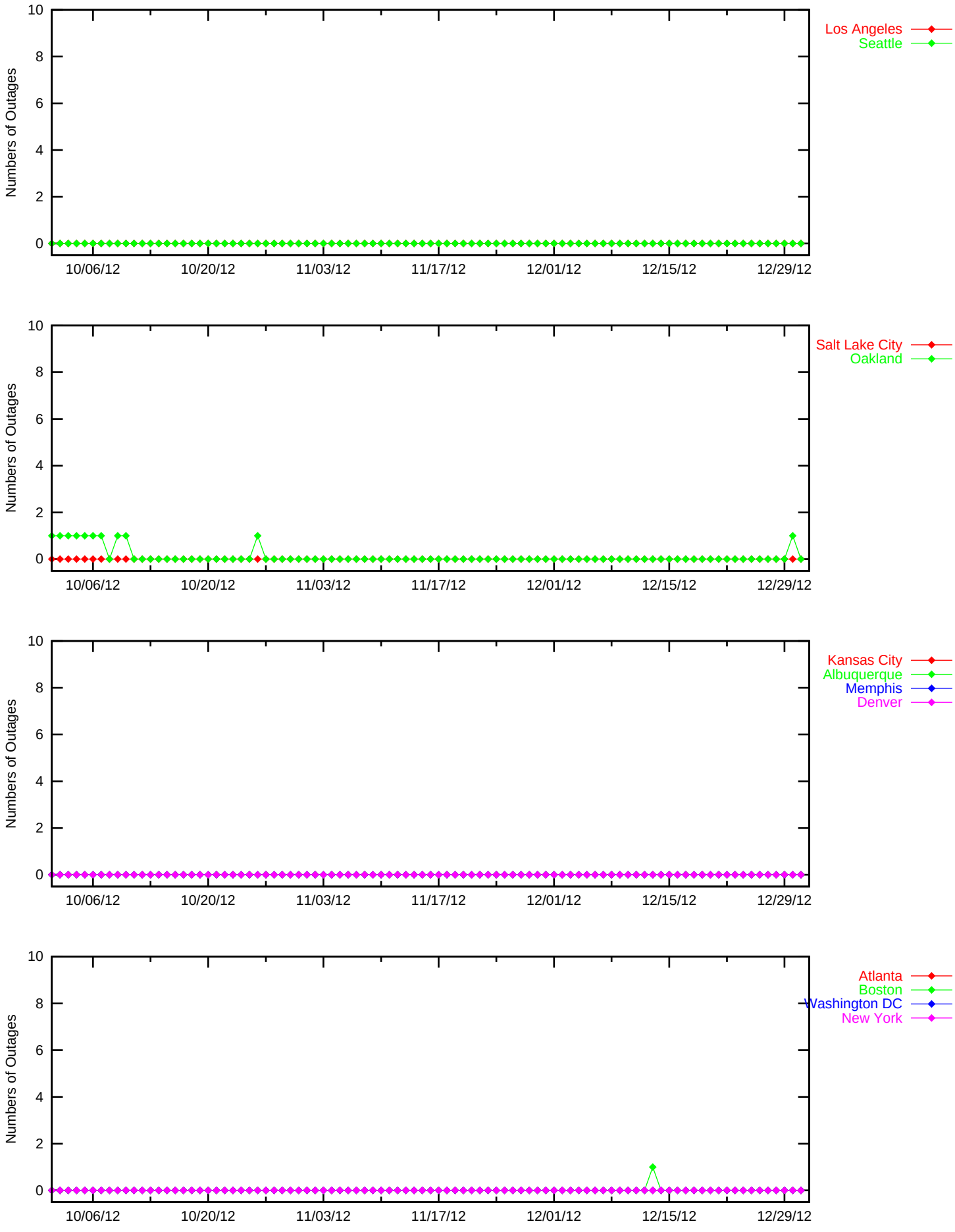


Figure 3-8 LPV Outages

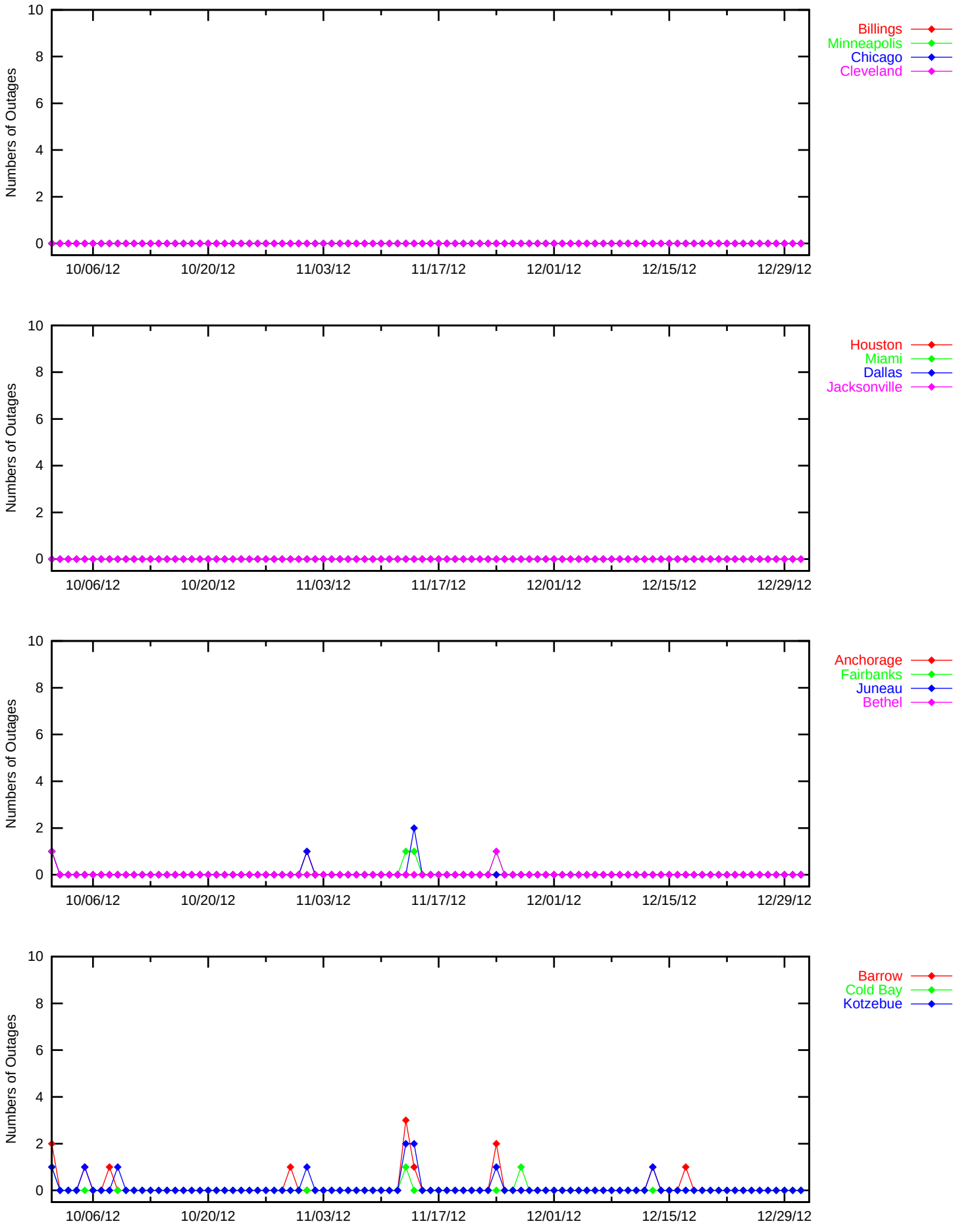


Figure 3-9 LPV Outages

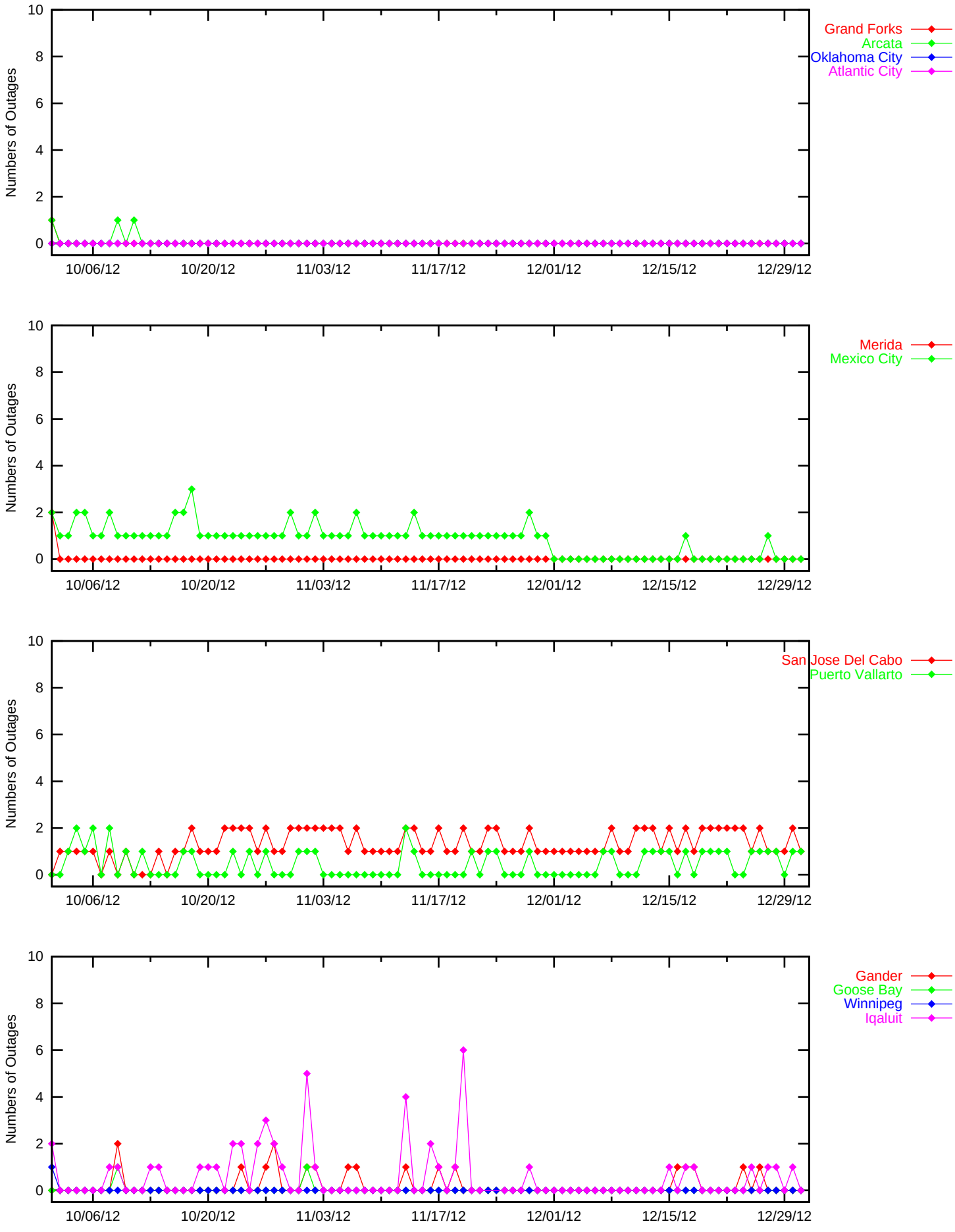


Figure 3-10 LPV 200 Outages

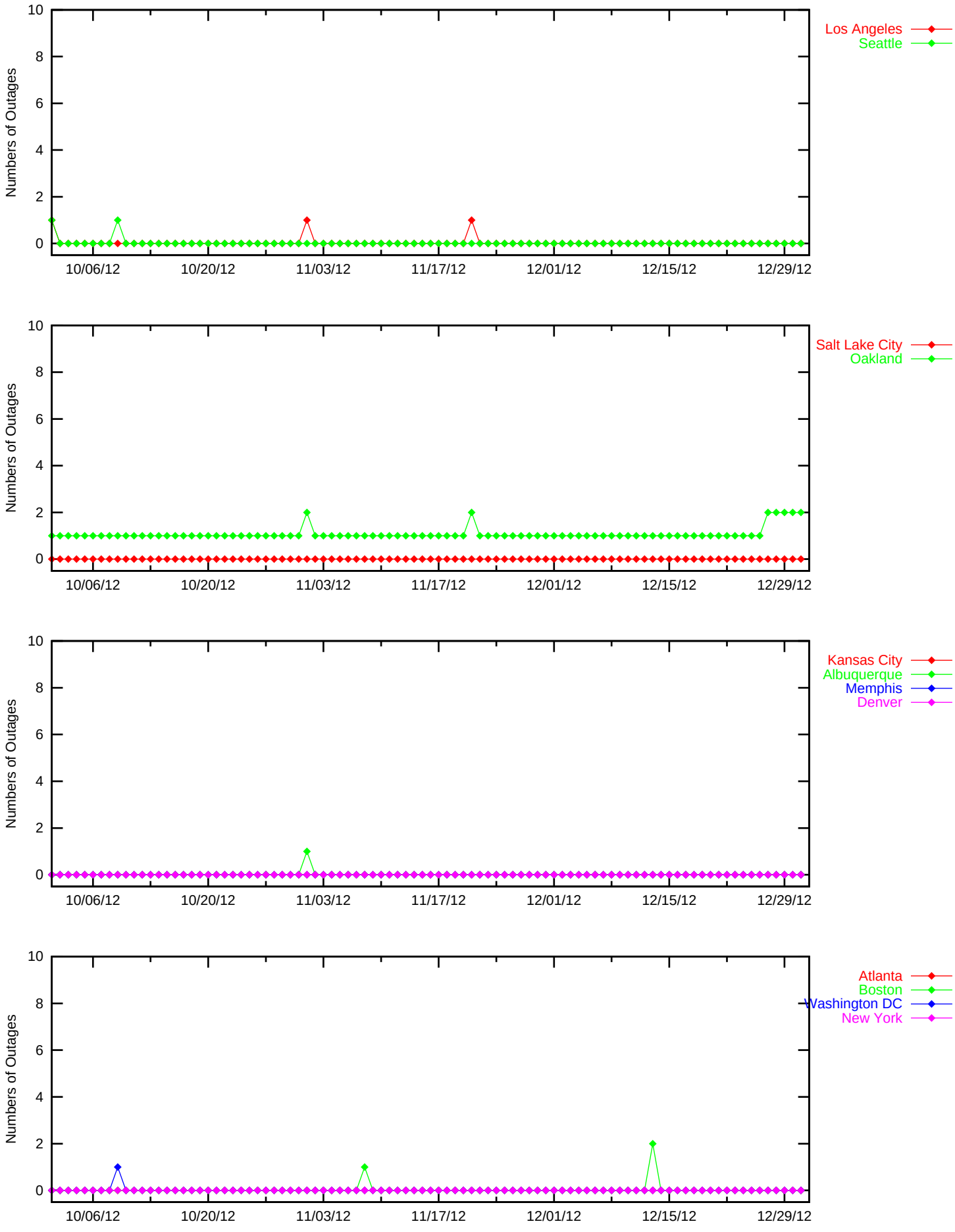
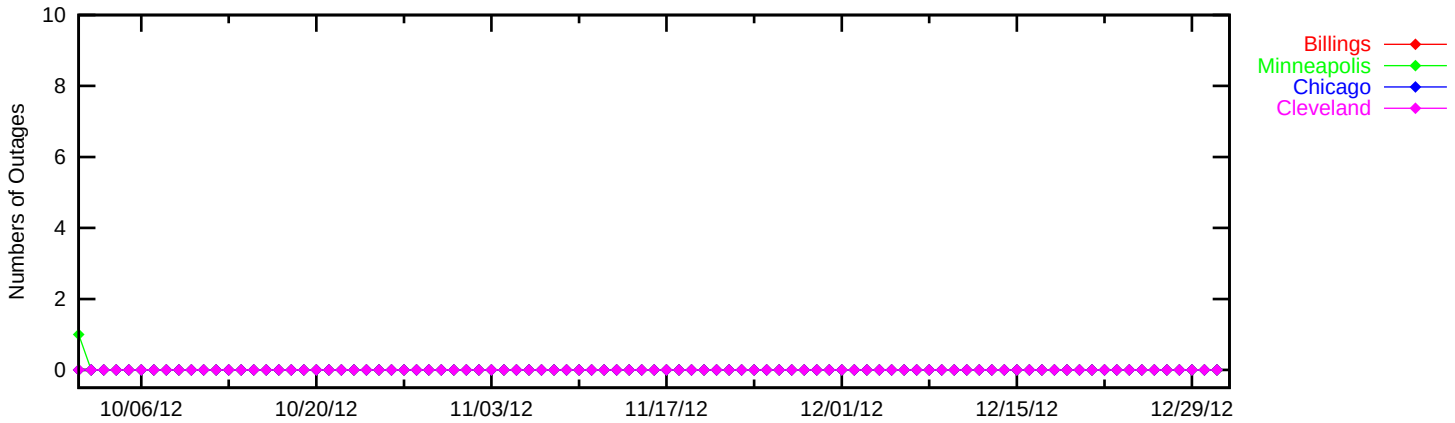
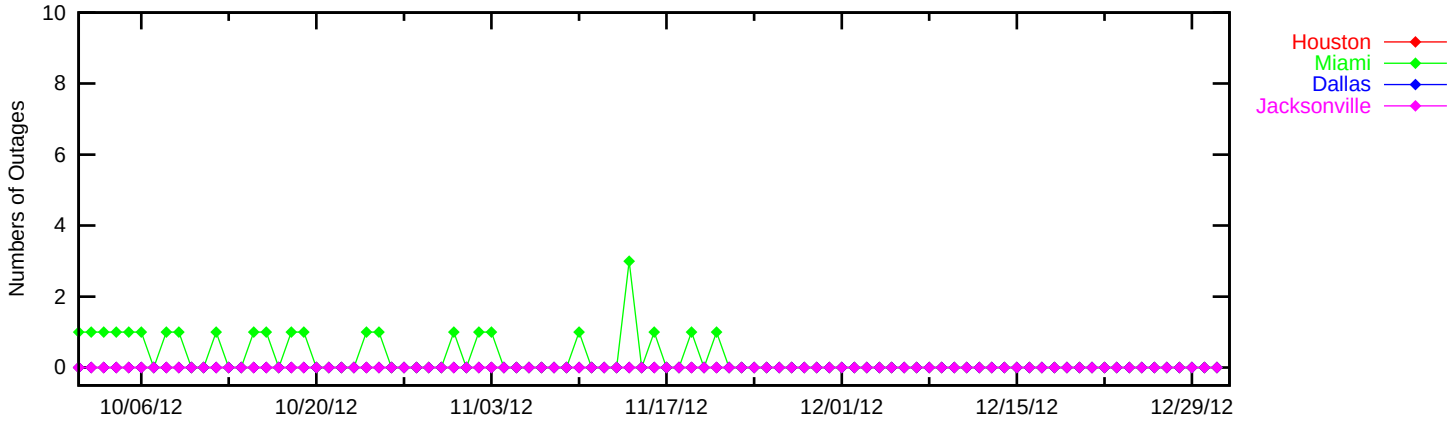
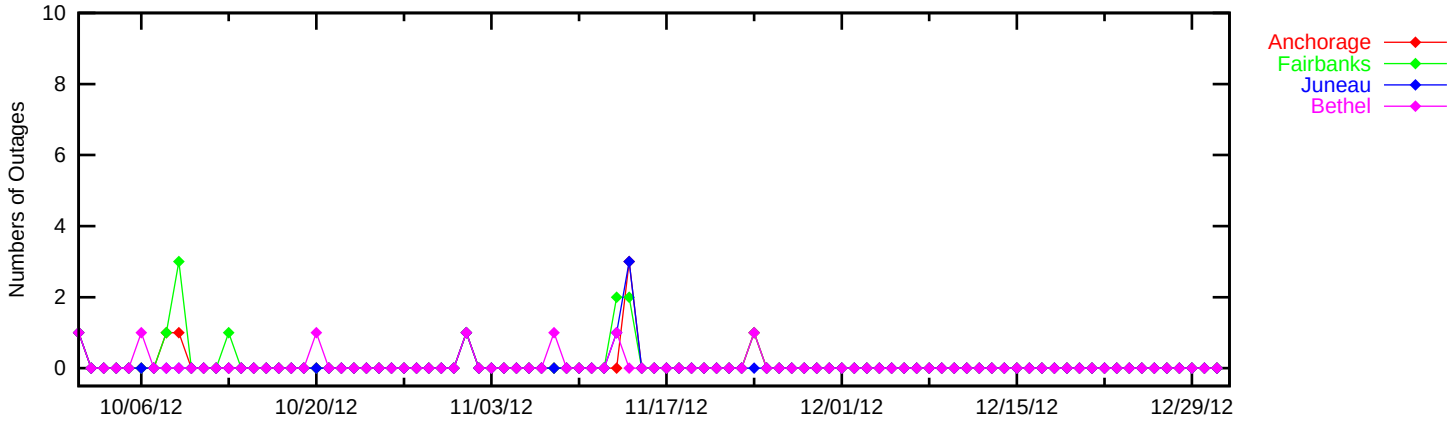


Figure 3-11 LPV 200 Outages







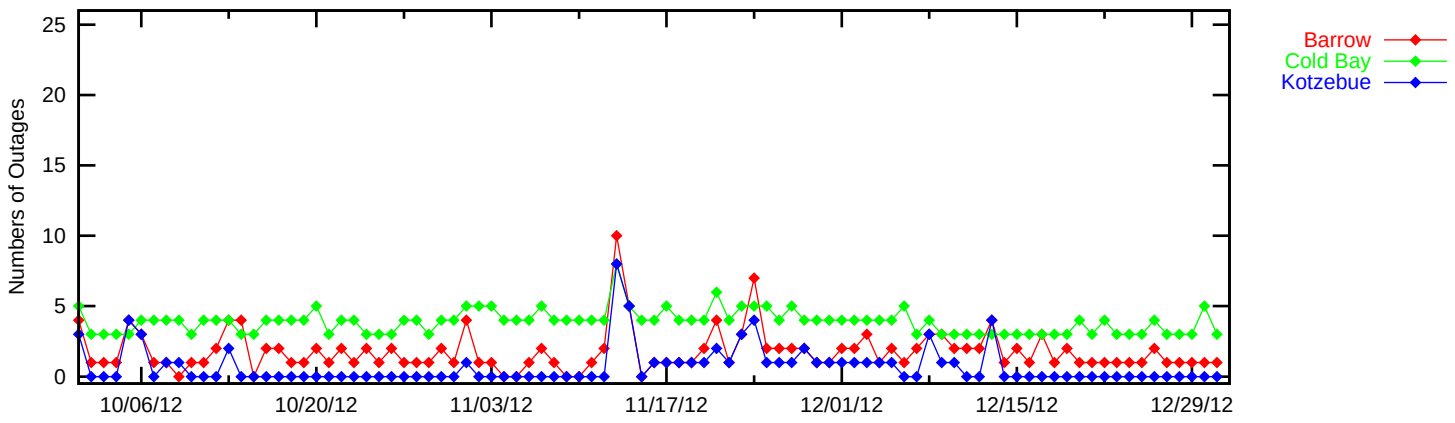
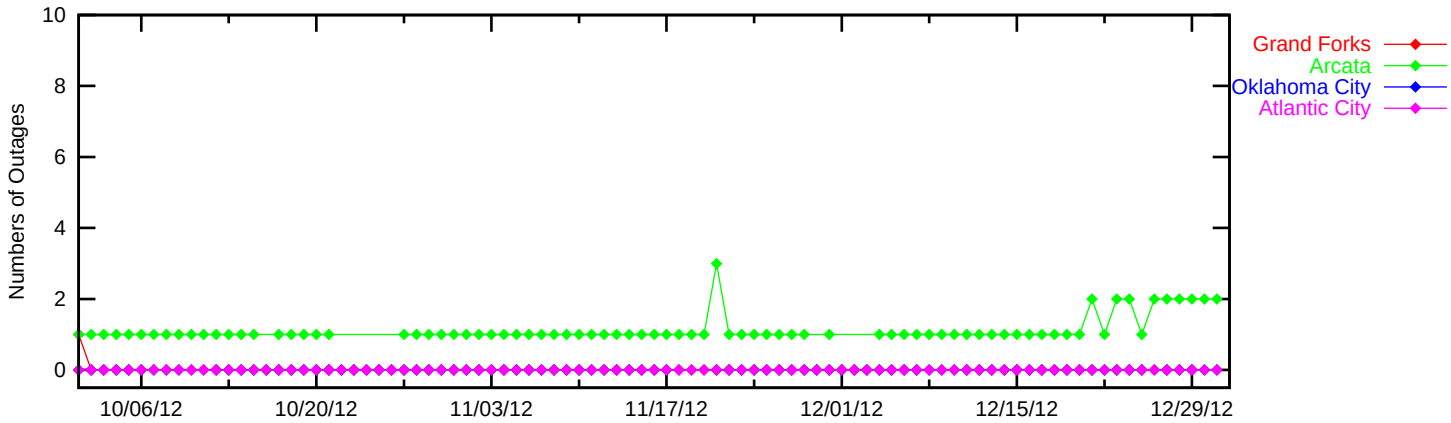
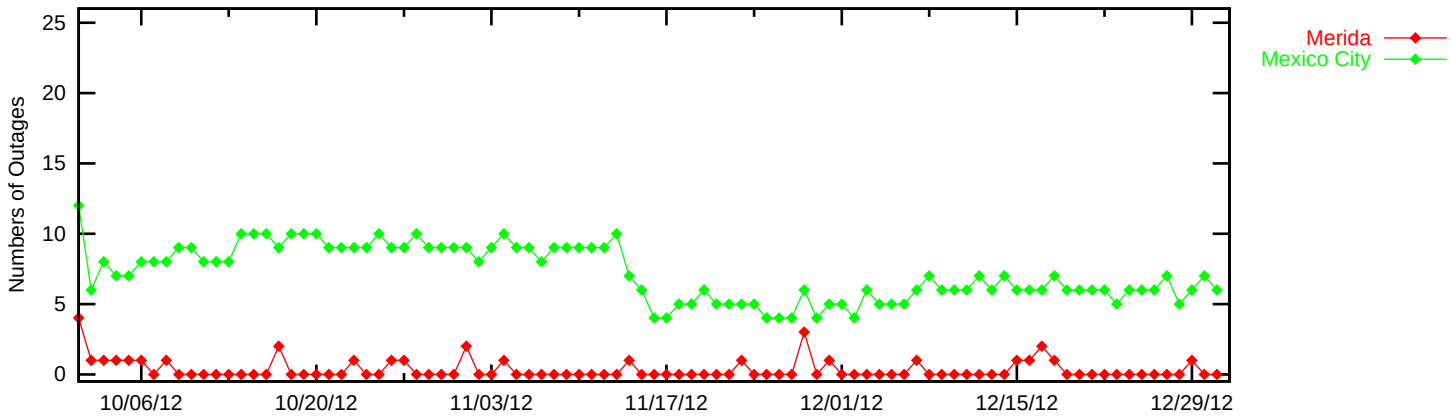
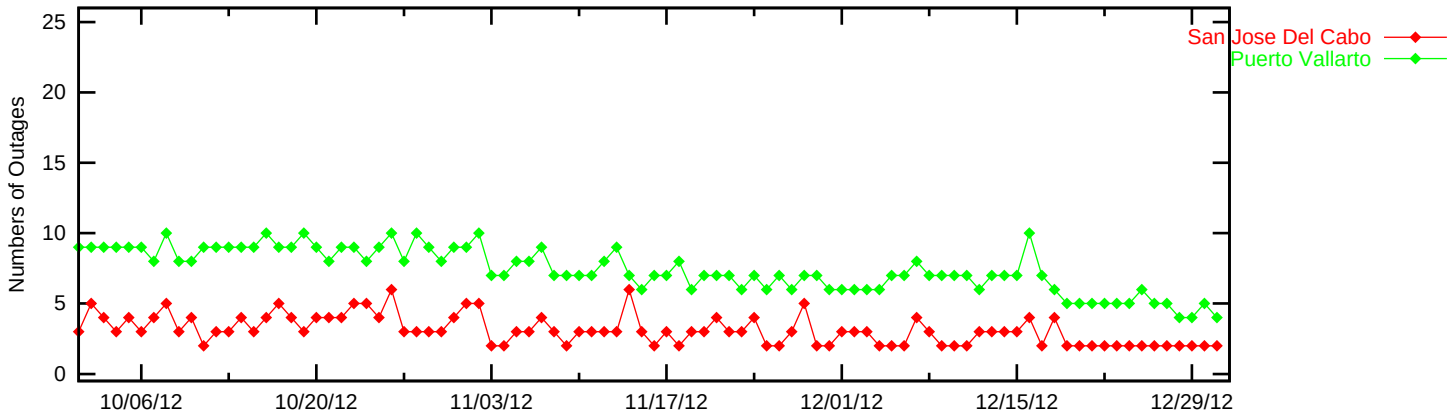
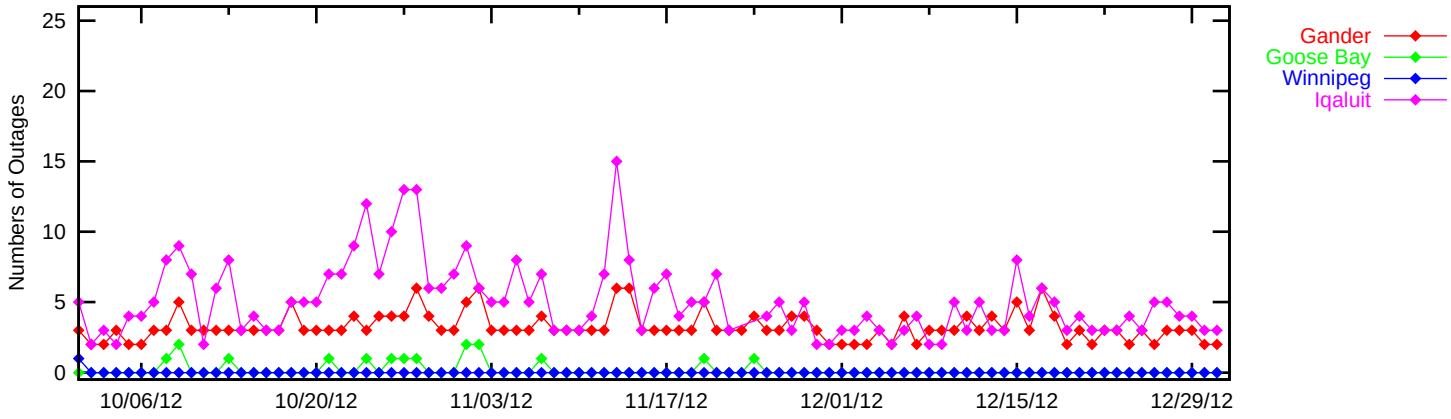


Figure 3-12 LPV 200 Outages









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 due to GUS switchovers, satellite outages, geomagnetic activity, and elevated UDRE and GIVE values. Please refer to Table 1-5 for the events that affected coverage.

Change in the satellite geometry increased CONUS coverage. Decline in geomagnetic activities was observed throughout the transition from equinox to solstice, which increased Canada and Mexico coverage. GUS faults caused missed navigation messages on November 23rd and December 8th which elevated UDRE values and reduced Alaska coverage.

Geomagnetic activity on October 1st and November 1st elevated GIVE values and significantly reduced CONUS, Alaska, and Canada coverage. Geomagnetic activity on November 13th, 14th and November 24th caused significant loss of coverage in Alaska and Canada. Geomagnetic activity on October 14th and November 20th affected mainly Canada coverage. Geomagnetic activity on October 8th and October 9th slightly reduced Alaska and Canada coverage and elevated vertical position errors at Fairbanks; see DR 111 Vertical Position Errors Increased at Fairbanks due to Ionospheric Scintillation.

SV alert on PRN 21 on October 20th slightly reduced Canada coverage.

Planned maintenance on PRN 1 on October 26th slightly affected Canada coverage. Planned maintenance on PRN 23 on November 13th reduced Alaska and Canada coverage. Planned maintenance on PRN 32 on November 21st affected CONUS, Alaska and Canada coverage. Planned Maintenance on PRN 2 on November 28th decreased Alaska and Mexico coverage. Planned maintenance on PRN 30 On December 12th slightly reduced Alaska coverage.

Manual GUS switchover on October 5th, November 13th, and December 13th elevated UDRE values and reduced Alaska coverage.

Radio frequency interference (RFI) caused localized loss of LPV200 coverage at Washington DC and Boston but had no effect on WAAS service. RFI events at Iqaluit caused localized loss of LPV and LPV200 coverage and slightly decreased PA coverage; see DR 112 RFI at Iqaluit caused Loss of Satellite Tracking.

Figure 4-1 LP North America Coverage for the Quarater

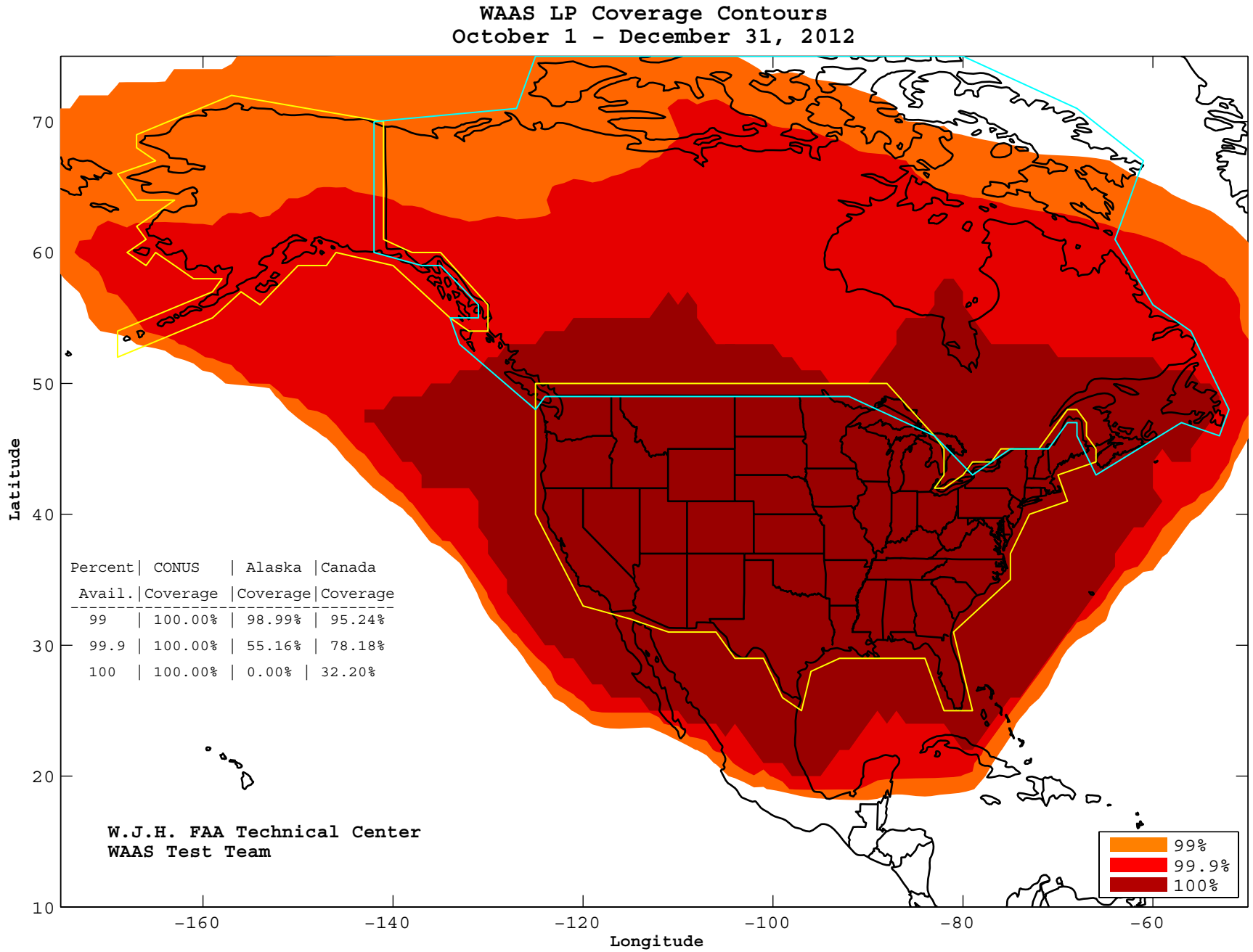


Figure 4-2 LPV North America Coverage for the Quarter

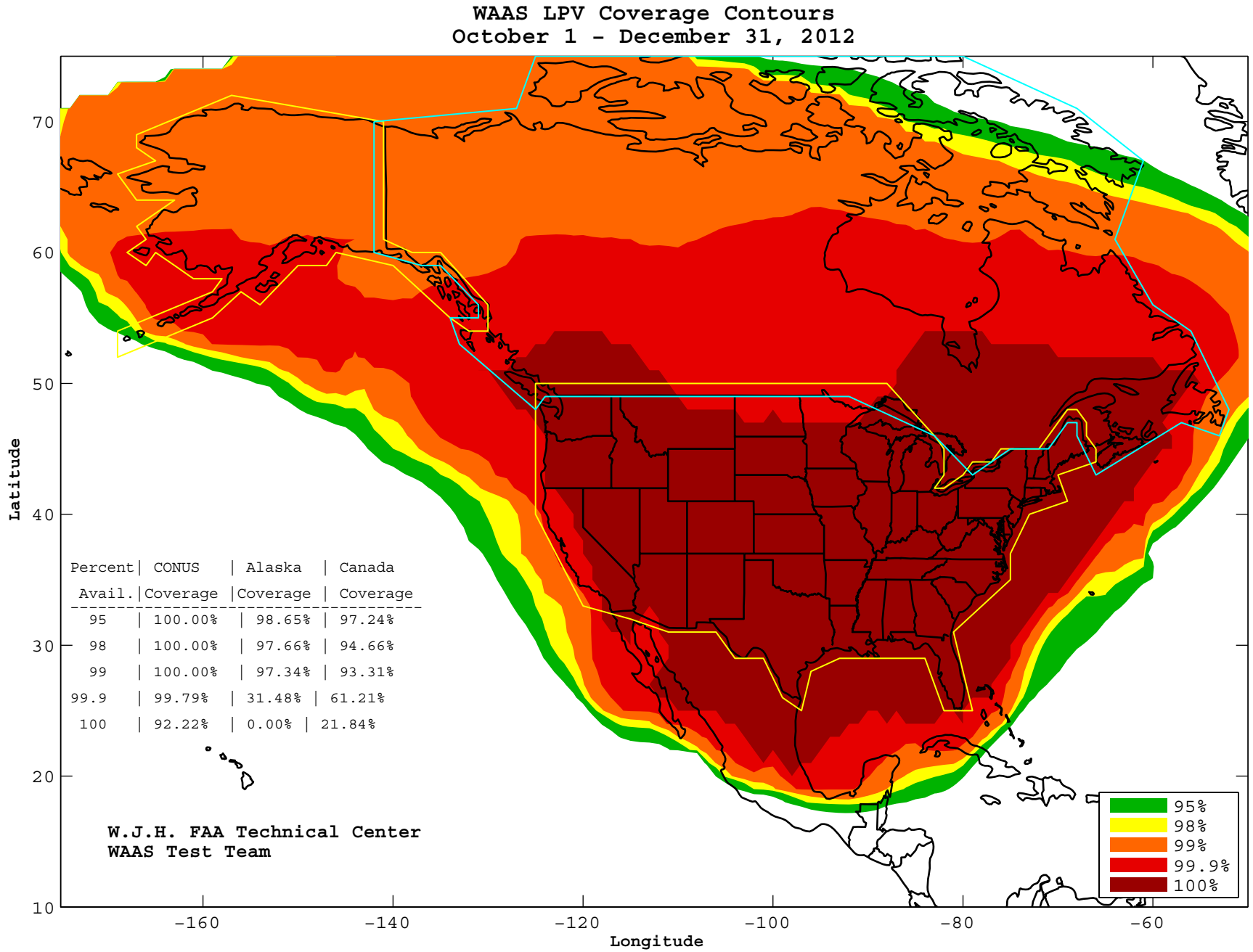


Figure 4-3 LPV 200 North America Coverage for the Quarter

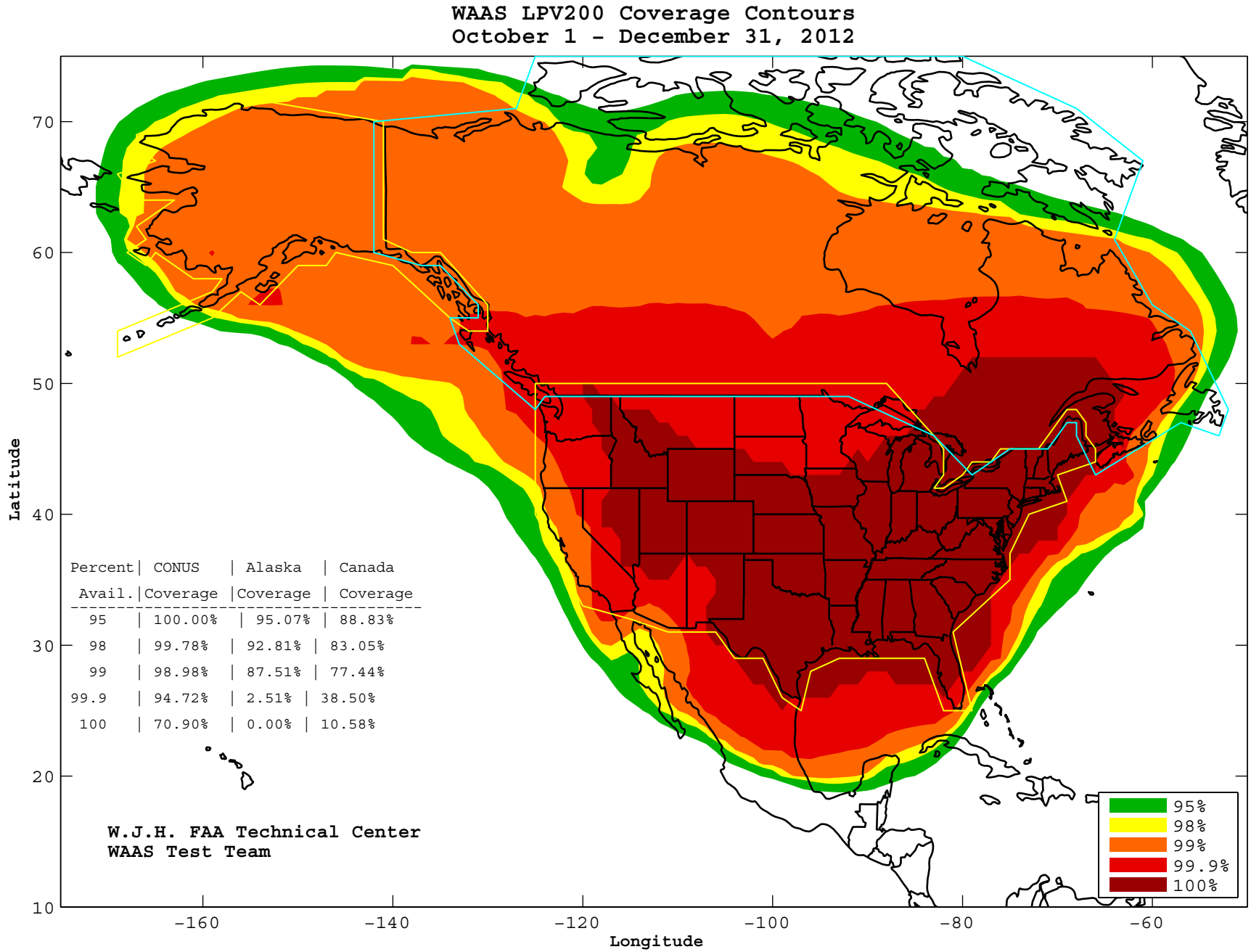


Figure 4-4 RNP 0.1 World Coverage for the Quarter

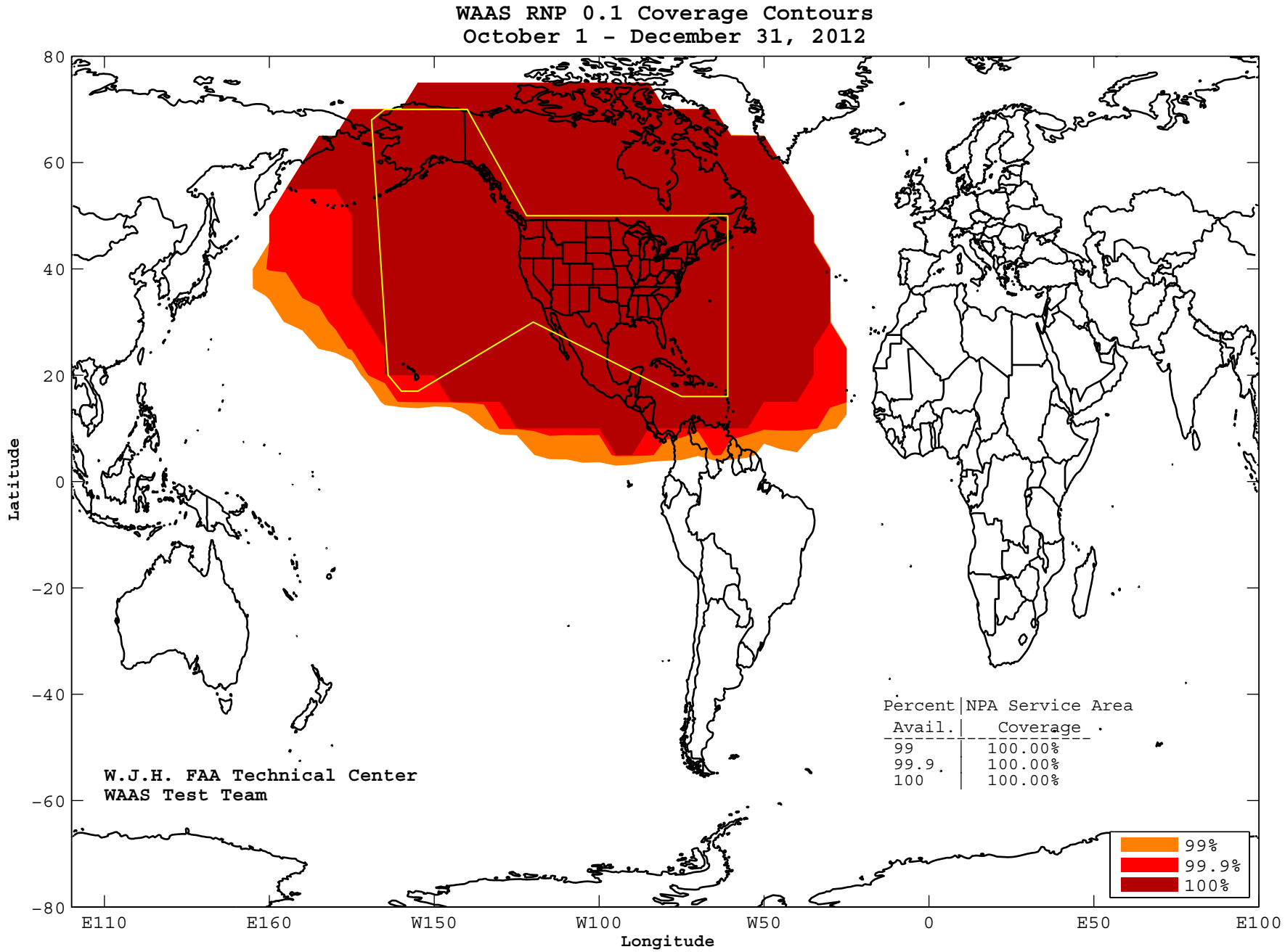


Figure 4-5 RNP 0.3 World Coverage for the Quarter

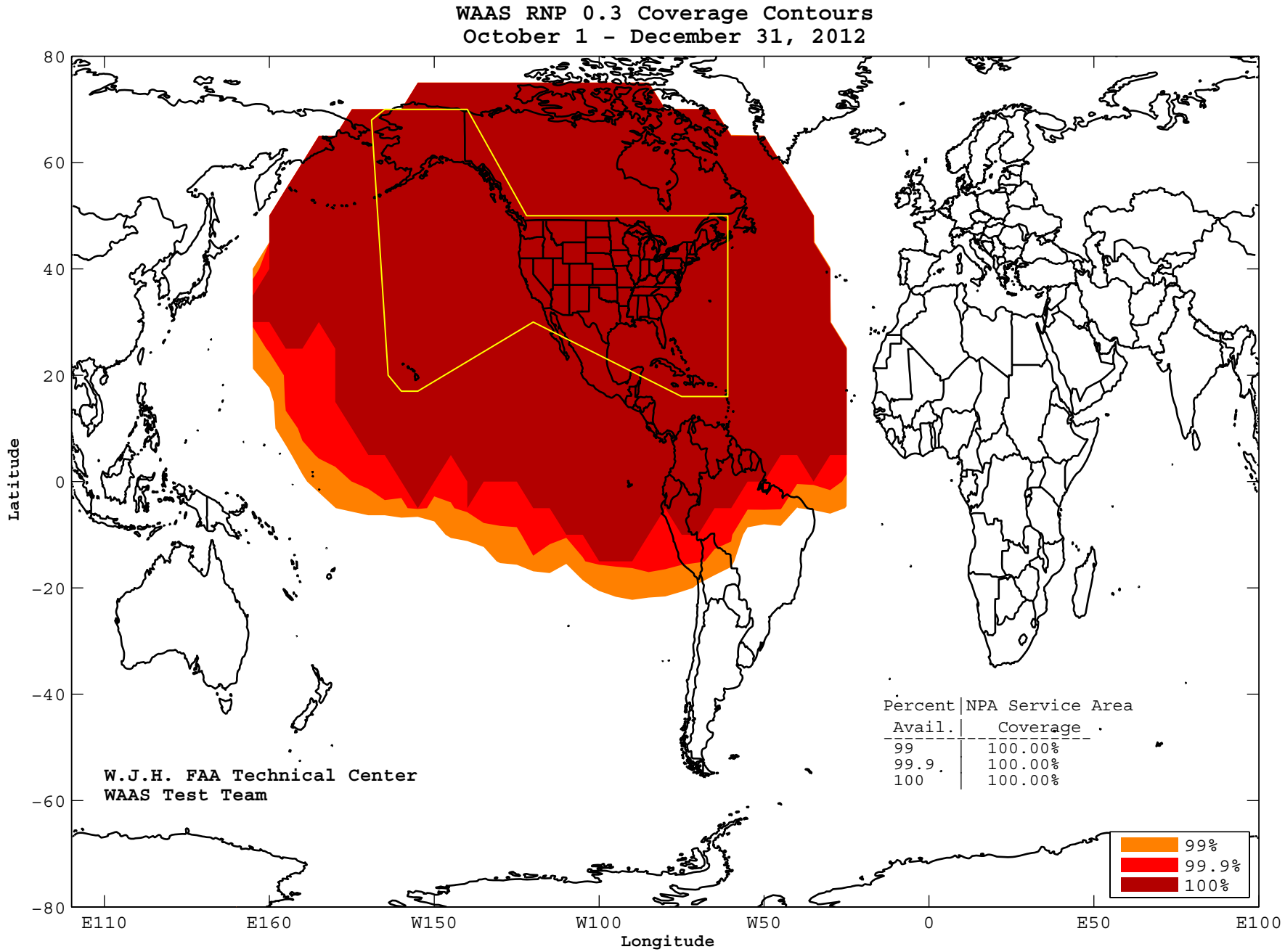


Figure 4-6 Daily LPV and LPV 200 CONUS Coverage

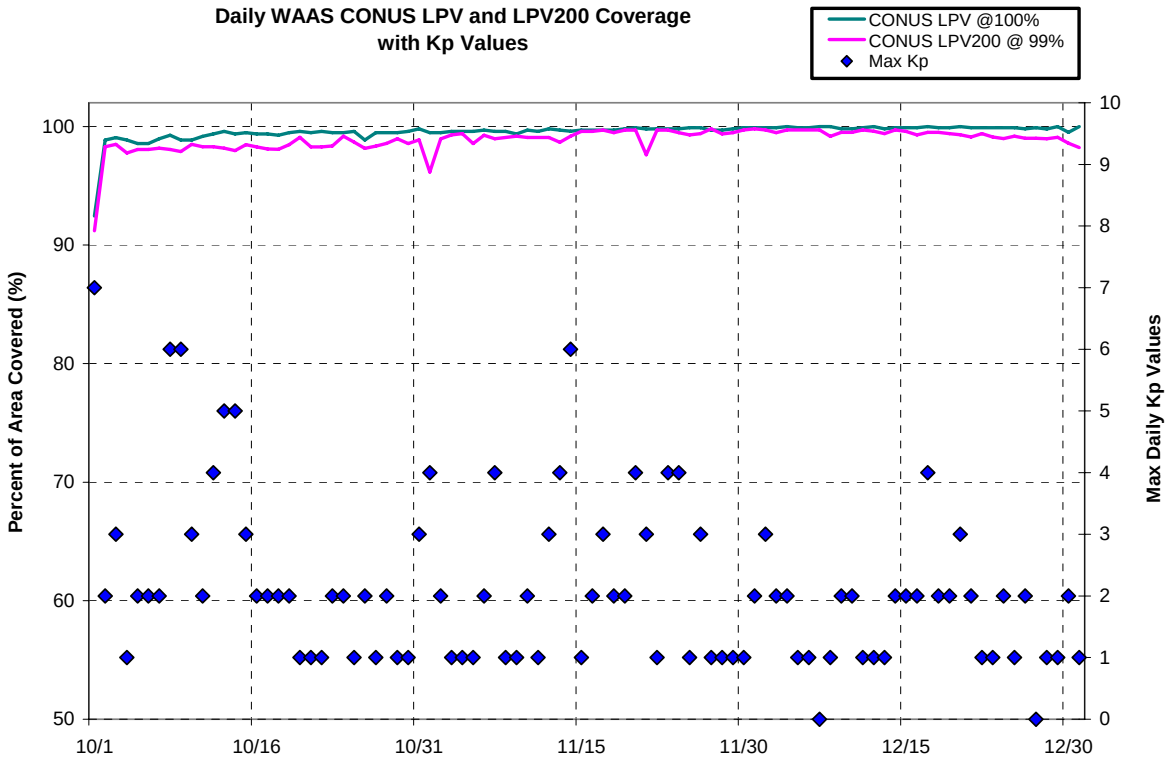


Figure 4-7 Daily LPV and LPV 200 Alaska Coverage

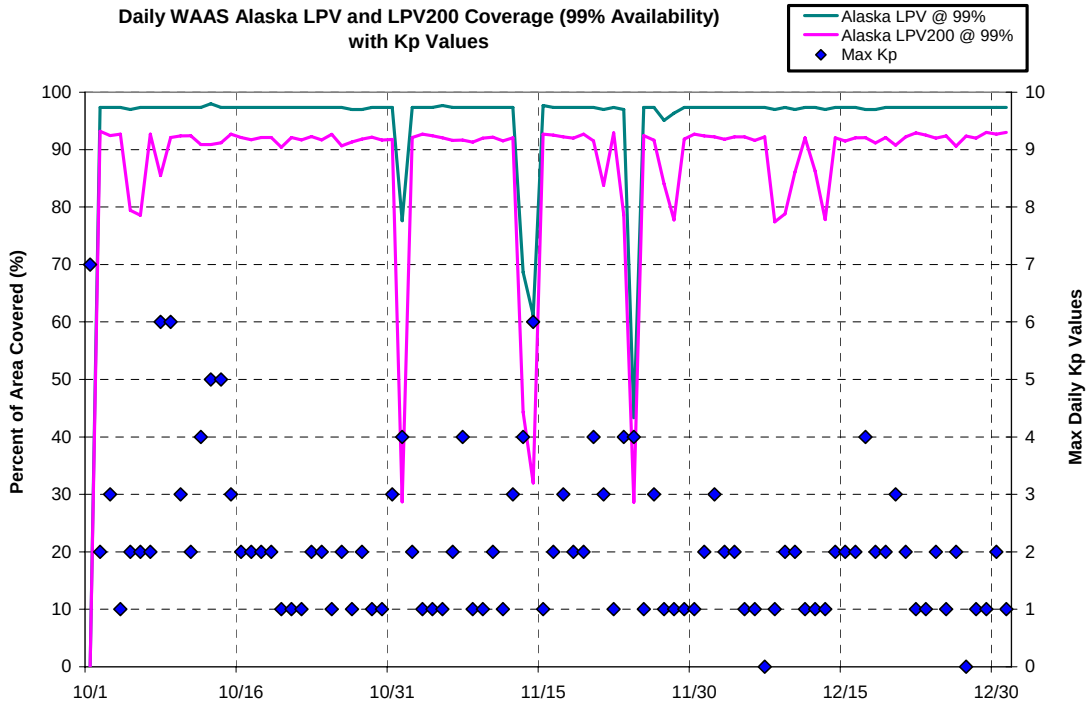


Figure 4-8 Daily LPV and LPV 200 Canada Coverage

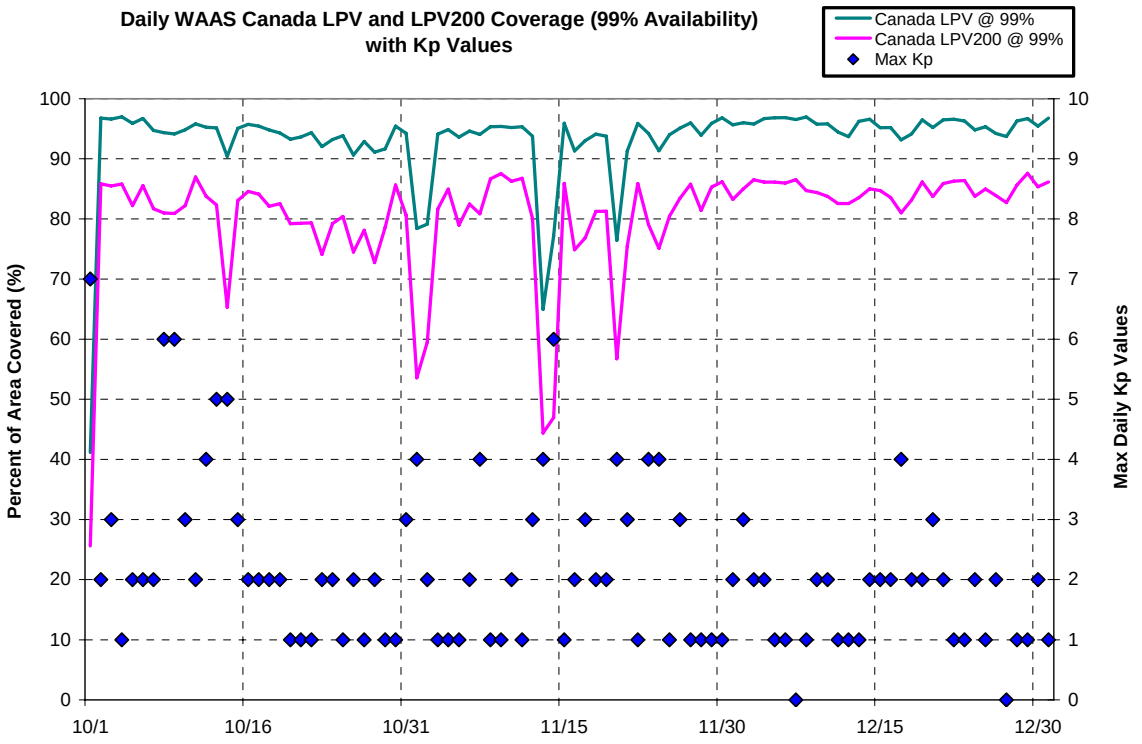
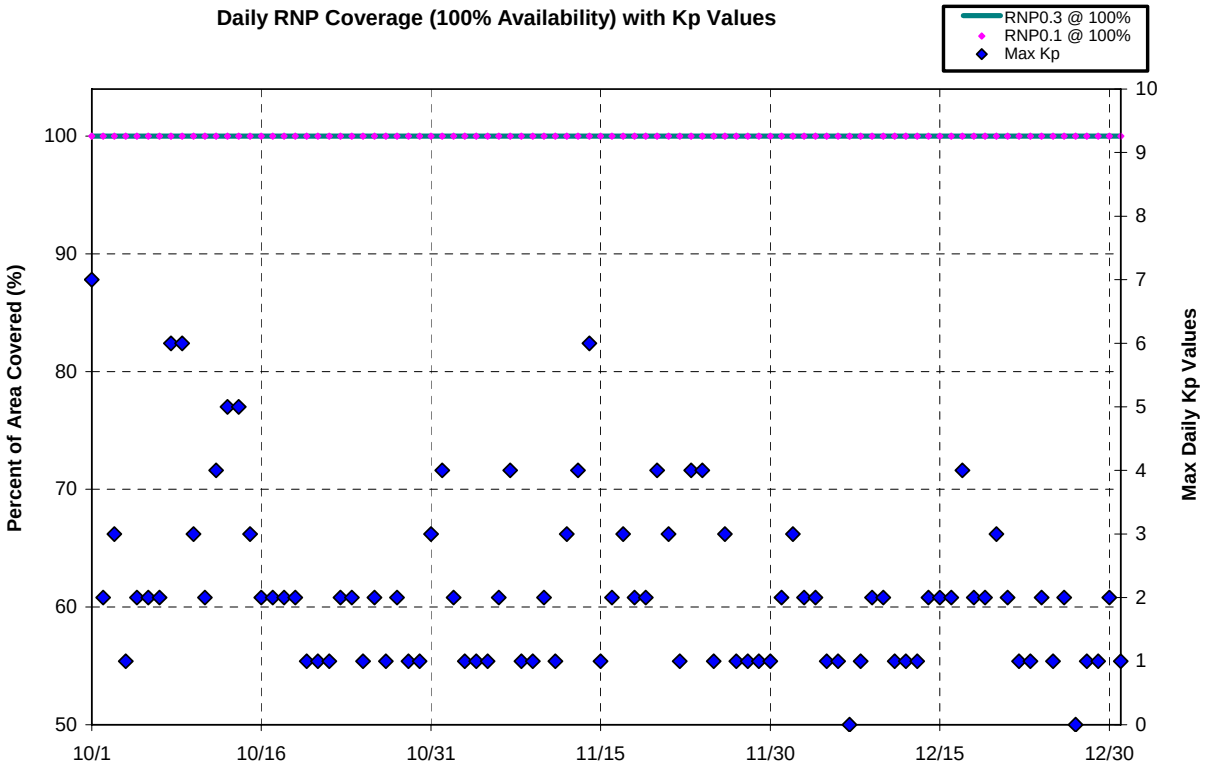


Figure 4-9 Daily RNP Coverage



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 1.61 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	3.97	6.47	0
Atlantic City	4.53	6.22	0
Grand Forks	3.34	5.21	0
Oklahoma City	6.38	4.56	0
Albuquerque	5.94	10.63	0
Anchorage	13.69	8.38	0
Atlanta	5.22	7.14	0
Barrow	5.90	6.28	0
Bethel	15.04	12.72	0
Billings	5.40	5.83	0
Boston	8.03	6.46	0
Chicago	4.46	4.82	0
Cleveland	6.36	3.99	0
Cold Bay	11.33	9.34	0
Dallas	4.51	6.09	0
Denver	4.84	7.98	0
Fairbanks	11.55	1.61	0
Gander	7.56	10.87	0
Goose Bay	5.47	6.36	0
Houston	4.80	4.81	0
Iqaluit	7.24	6.64	0
Jacksonville	5.07	5.10	0
Juneau	4.25	3.22	0
Kansas City	4.47	6.16	0
Kotzebue	8.68	5.22	0
Los Angeles	6.53	5.94	0
Memphis	4.41	4.89	0
Merida	9.85	4.87	0
Mexico City	8.67	5.61	0
Miami	10.22	4.85	0
Minneapolis	5.49	4.59	0
New York	5.97	9.04	0
Oakland	6.10	8.54	0
Puerto Vallarta	6.60	12.23	0
Salt Lake City	5.77	5.67	0
San Jose Del Cabo	9.89	11.33	0
Seattle	5.34	5.36	0
Washington DC	5.40	5.84	0
Winnipeg	3.84	6.11	0

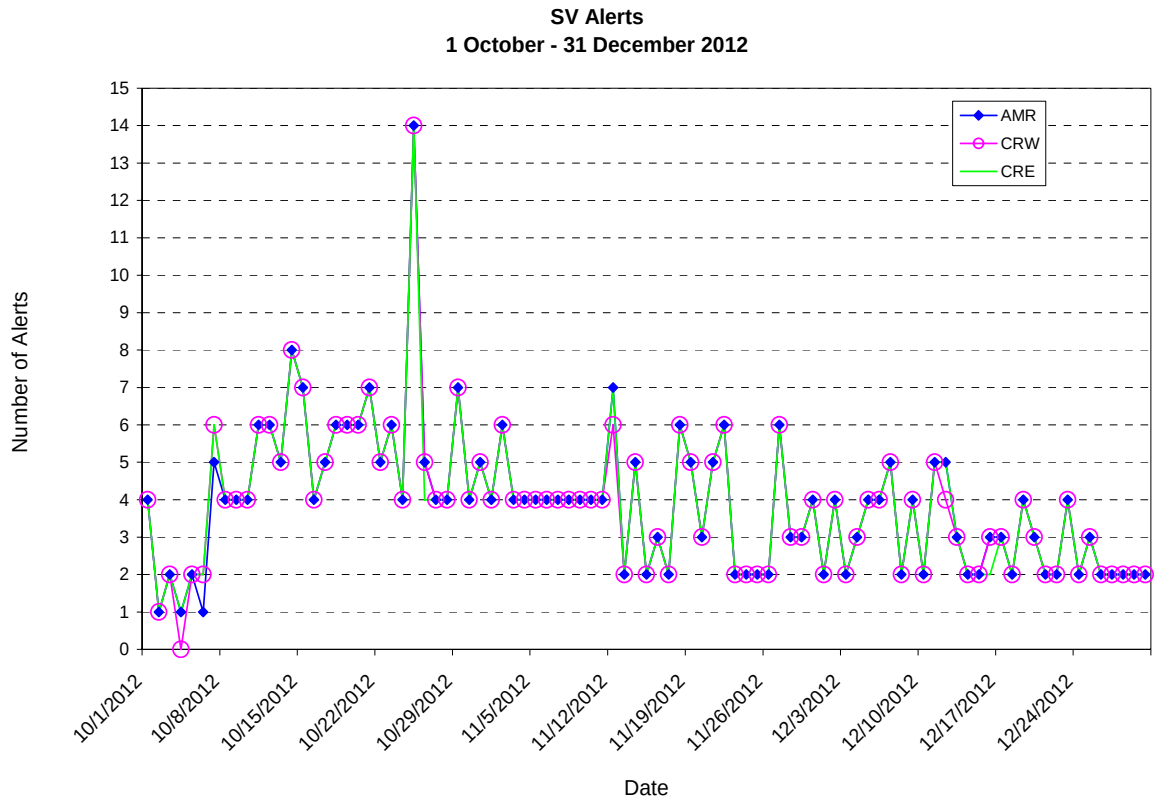
5.2 Broadcast Alerts

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	26	26	26	0.2826	0.2826	0.2826
3	103	103	103	1.1196	1.1196	1.1196
4	226	225	226	2.4565	2.4457	2.4565
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	355	354	355	3.8587	3.8478	3.8587
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. Table 5-9 to 5-13 show message rates statistics broadcasted on CRW. Table 5-14 to 5-18 show message rates statistics on CRE.

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	101345	0	0
2	1324728	95	18
3	1324920	138	18
4	1325323	109	22
7	94846	11	131
9	93139	0	0
10	94814	11	134
17	31215	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	49554	0	0
2	47061	1	150
3	48795	0	0
4	47507	0	0
5	48083	0	0
6	50247	0	0
7	47400	0	0
8	47621	0	0
9	48726	0	0
10	48827	0	0
11	50219	0	0
12	47923	0	0
13	47143	0	0
14	47541	0	0
15	48609	0	0
16	48019	0	0
17	47087	1	150
18	47046	0	0
19	49278	0	0
20	48897	0	0
21	47632	0	0
22	47637	1	179
23	47049	0	0
24	25951	0	0
25	49419	0	0
26	48506	0	0
27	3170	0	0
28	48035	0	0
29	47517	0	0
30	47485	0	0
31	48250	1	162
32	47283	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	40712	1	149
2	38683	0	0
3	40053	1	149
4	38985	2	208
5	39458	0	0
6	41293	0	0
7	38880	0	0
8	39128	0	0
9	40030	2	160
10	40140	1	224
11	41278	1	133
12	39331	1	208
13	38692	0	0
14	39056	0	0
15	39925	0	0
16	39400	0	0
17	38683	1	205
18	38616	1	143
19	40397	1	168
20	40143	0	0
21	39128	0	0
22	39157	4	208
23	38593	0	0
24	21344	0	0
25	40567	1	160
26	39824	1	150
27	2604	0	0
28	39456	9	210
29	39015	0	0
30	38927	0	0
31	39564	0	0
32	38796	0	0
133	76361	1	143
135	76153	1	181
138	76022	2	208

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27584	5	306
0	1	27585	4	305
0	2	27606	2	580
1	0	27581	3	584
1	1	27590	6	579
1	2	27595	6	306
1	3	27584	5	307
1	4	27587	2	312
2	0	27583	6	312
2	1	27588	6	301
2	2	27582	6	582
2	3	27588	1	301
2	4	27591	3	301
3	0	27596	2	306
3	1	27589	1	306
3	2	27586	4	306
9	0	27578	4	306
9	1	27592	5	304
9	2	27589	4	301
9	3	27600	5	307
9	4	27590	3	304
9	5	27575	6	306
9	6	27606	3	307

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

Band	On Time	Late	Max Late Length (seconds)
0	35417	0	0
1	35412	0	0
2	35406	0	0
3	35356	1	414
9	35365	0	0

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

Message Type	On Time	Late	Max Late Length (seconds)
1	101410	1	125
2	1324727	95	18
3	1324918	138	22
4	1325321	110	18
7	95028	10	168
9	93139	0	0
10	94983	9	131
17	31201	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	49551	0	0
2	47065	0	0
3	48796	1	173
4	47505	0	0
5	48078	2	160
6	50254	0	0
7	47414	0	0
8	47623	0	0
9	48722	0	0
10	48833	0	0
11	50224	0	0
12	47917	0	0
13	47147	0	0
14	47549	1	180
15	48609	1	179
16	48028	0	0
17	47084	0	0
18	47022	1	173
19	49282	2	181
20	48900	2	181
21	47645	0	0
22	47643	1	179
23	47048	0	0
24	25956	0	0
25	49419	0	0
26	48503	0	0
27	3171	0	0
28	48042	0	0
29	47512	0	0
30	47476	1	179
31	48247	0	0
32	47278	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	40715	0	0
2	38673	0	0
3	40057	2	208
4	38984	0	0
5	39463	0	0
6	41293	0	0
7	38868	0	0
8	39118	0	0
9	40020	2	200
10	40129	0	0
11	41277	0	0
12	39335	0	0
13	38694	0	0
14	39041	0	0
15	39923	0	0
16	39398	0	0
17	38678	0	0
18	38595	1	209
19	40413	0	0
20	40163	0	0
21	39112	0	0
22	39158	2	138
23	38589	0	0
24	21324	1	130
25	40591	1	162
26	39816	0	0
27	2600	2	208
28	39470	8	280
29	39015	0	0
30	38928	0	0
31	39554	0	0
32	38784	1	208
133	76358	0	0
135	76165	3	4325
138	76052	2	4246

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27598	3	307
0	1	27578	3	305
0	2	27582	7	305
1	0	27604	4	302
1	1	27593	3	306
1	2	27586	2	305
1	3	27584	4	305
1	4	27586	2	301
2	0	27591	4	579
2	1	27584	4	305
2	2	27600	4	306
2	3	27577	3	306
2	4	27590	2	301
3	0	27589	4	307
3	1	27580	5	307
3	2	27592	5	306
9	0	27590	3	306
9	1	27590	3	306
9	2	27589	0	0
9	3	27596	5	305
9	4	27583	6	306
9	5	27593	0	0
9	6	27591	2	307

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

Band	On Time	Late	Max Late Length (seconds)
0	35351	0	0
1	35349	0	0
2	35398	1	452
3	35324	0	0
9	35371	0	0

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

Message Type	On Time	Late	Max Late Length (seconds)
1	106455	3	136
2	1324726	97	15
3	1324923	138	12
4	1325331	110	10
7	99684	9	139
9	93140	0	0
10	99650	6	130
17	31611	2	307

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

SV	On Time	Late	Max Late Length (seconds)
1	49556	0	0
2	47073	0	0
3	48800	0	0
4	47506	0	0
5	48079	1	163
6	50254	0	0
7	47396	0	0
8	47617	0	0
9	48725	0	0
10	48830	0	0
11	50230	1	169
12	47921	1	169
13	47146	0	0
14	47548	0	0
15	48609	0	0
16	48024	1	188
17	47081	0	0
18	47008	0	0
19	49278	0	0
20	48909	0	0
21	47640	0	0
22	47641	2	179
23	47050	1	178
24	25956	0	0
25	49415	0	0
26	48500	0	0
27	3169	0	0
28	48057	0	0
29	47510	0	0
30	47491	0	0
31	48248	1	164
32	47275	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	40697	1	135
2	38679	0	0
3	40054	0	0
4	38992	0	0
5	39461	1	160
6	41296	0	0
7	38881	0	0
8	39119	0	0
9	40020	0	0
10	40135	0	0
11	41280	0	0
12	39354	0	0
13	38691	0	0
14	39061	1	128
15	39920	0	0
16	39393	0	0
17	38687	0	0
18	38604	0	0
19	40414	0	0
20	40146	1	207
21	39121	0	0
22	39148	1	181
23	38598	1	208
24	21333	0	0
25	40592	0	0
26	39821	0	0
27	2603	0	0
28	39464	1	160
29	38999	0	0
30	38931	1	208
31	39566	0	0
32	38785	0	0
133	76387	1	139
135	76152	1	138
138	76020	2	4042

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27592	5	312
0	1	27571	14	312
0	2	27570	10	324
1	0	27592	8	342
1	1	27585	7	336
1	2	27590	6	341
1	3	27578	9	580
1	4	27580	7	397
2	0	27583	8	386
2	1	27596	7	396
2	2	27581	6	386
2	3	27583	8	374
2	4	27572	11	378
3	0	27587	8	357
3	1	27589	6	357
3	2	27576	8	366
9	0	27582	6	343
9	1	27586	6	350
9	2	27584	7	338
9	3	27589	7	350
9	4	27588	8	331
9	5	27576	8	346
9	6	27594	10	349

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

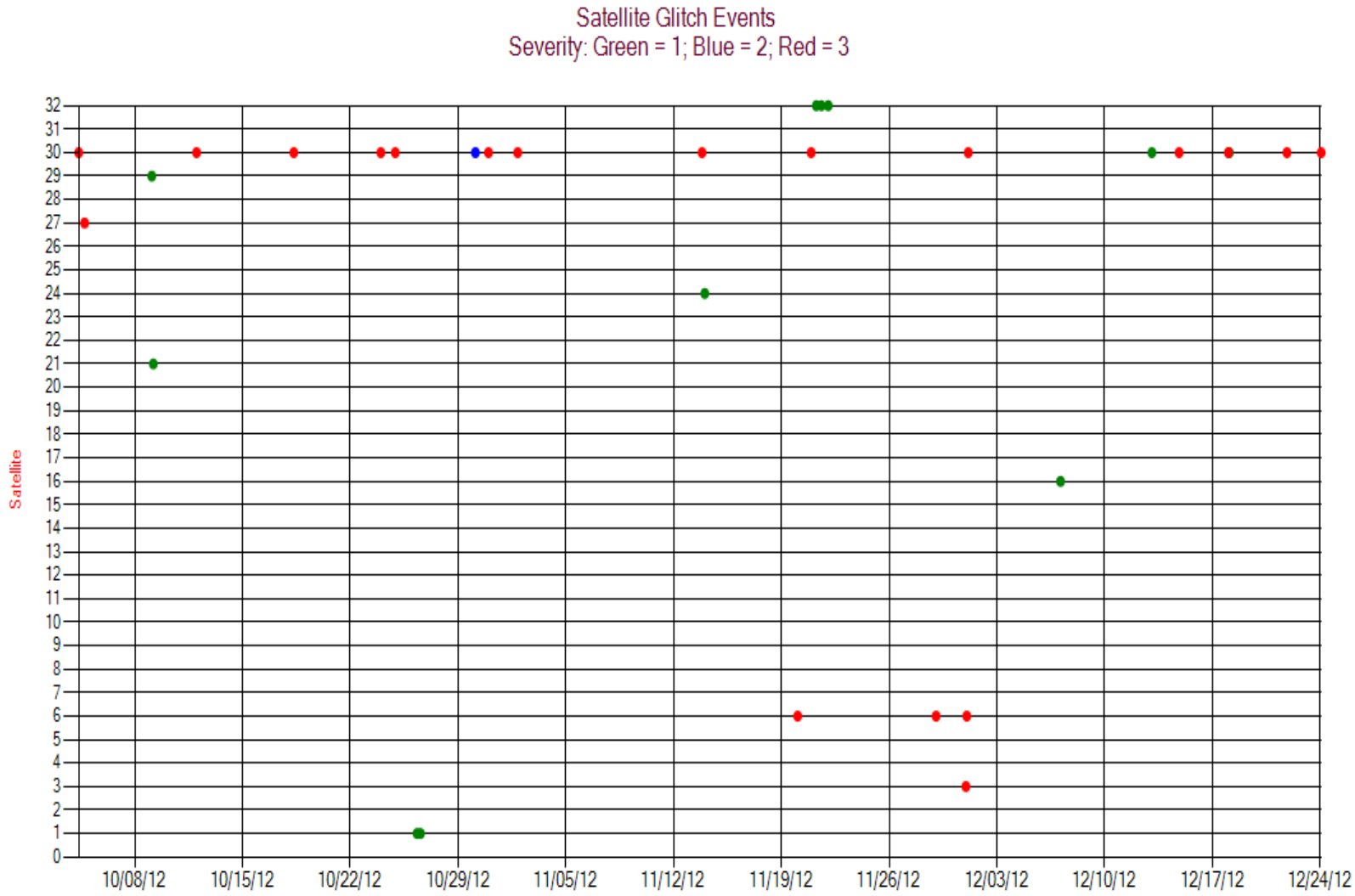
Band	On Time	Late	Max Late Length (seconds)
0	36001	2	449
1	36048	2	374
2	35968	1	416
3	36019	1	316
9	36060	0	0

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.

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 at Salt Lake City, Billings, Miami and Houston 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	2.585	100	2.292	100	2.508	100	2.079	100	2.002	100	2.511	100
2	1.673	100	1.634	100	1.932	100	2.130	100	2.626	99.9433	1.844	100
3	1.166	100	0.848	100	1.177	100	1.105	100	1.298	100	0.941	100
4	1.778	100	1.413	100	1.634	100	0.976	100	1.813	100	1.909	100
5	1.984	100	1.797	100	1.399	100	0.976	100	1.115	100	1.568	100
6	1.674	100	1.200	100	1.484	100	0.814	100	0.906	100	0.884	100
7	1.390	100	0.932	100	1.145	100	1.029	100	1.178	100	1.110	100
8	1.096	100	0.675	100	1.045	100	0.976	100	1.547	100	1.113	100
9	1.122	100	1.046	100	1.284	100	0.970	100	1.267	100	1.497	100
10	1.086	100	1.006	100	1.047	100	1.403	100	2.348	100	1.354	100
11	0.918	100	0.818	100	0.916	100	1.053	100	2.433	100	0.857	100
12	1.330	100	1.228	100	1.028	100	1.249	100	1.232	100	1.424	100
13	1.377	100	1.412	100	1.138	100	1.040	100	1.919	100	0.990	100
14	1.654	100	0.661	100	0.872	100	1.571	100	1.897	100	1.217	100
15	1.353	100	1.655	100	1.368	100	0.856	100	1.063	100	1.377	100
16	0.838	100	1.251	100	1.103	100	1.401	100	2.053	100	1.689	100
17	2.650	100	0.969	100	1.556	100	0.686	100	1.484	100	1.111	100
18	1.182	100	1.211	100	1.410	100	1.942	100	2.085	100	1.407	100
19	2.554	100	2.151	100	2.504	100	2.631	100	3.324	100	2.815	100
20	0.851	100	1.282	100	1.117	100	1.593	100	1.917	100	1.259	100
21	1.312	100	1.420	100	1.394	100	2.072	100	1.915	100	1.604	100
22	2.323	100	1.942	100	2.222	100	3.000	100	3.110	100	2.213	100
23	1.421	100	1.674	100	1.559	100	2.101	100	2.653	100	1.419	100
24	2.654	100	2.895	100	3.062	100	2.264	100	2.741	100	2.584	100
25	2.819	99.9905	3.349	100	2.133	100	2.045	100	2.392	100	2.395	100
26	1.573	100	1.344	100	1.305	100	1.011	100	1.235	100	1.251	100
27	1.294	100	1.272	100	1.545	100	0.900	100	1.116	100	1.344	100
28	0.786	100	0.824	100	1.122	100	1.205	100	1.651	100	1.110	100
29	1.849	100	1.671	100	1.109	100	1.287	100	1.108	100	1.453	100
30	1.174	100	0.930	100	1.101	100	1.186	100	1.901	100	1.179	100
31	1.979	100	1.173	100	0.892	100	0.763	100	1.341	100	1.561	100
32	1.394	100	0.876	100	1.094	100	0.913	100	2.135	100	1.122	100
135	2.059	100	2.193	100	2.879	100	2.090	100	2.312	100	1.450	100
138	1.296	100	1.428	100	1.509	100	1.786	100	1.742	100	1.589	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	2.208	100	2.987	100	1.783	100	2.739	100	2.189	100	2.377	100
2	1.325	100	1.366	100	2.467	100	1.612	100	2.045	100	1.516	100
3	1.925	100	1.167	100	0.936	100	1.279	100	0.805	100	1.530	100
4	1.369	100	1.571	100	1.338	100	1.388	100	1.151	100	1.650	100
5	1.467	100	1.627	100	1.109	100	1.759	100	0.857	100	1.633	100
6	1.245	100	1.566	100	1.104	100	1.703	100	0.827	100	1.679	100
7	1.198	100	1.567	100	1.516	100	1.241	100	0.706	100	1.664	100
8	0.822	100	0.887	100	1.261	100	1.600	100	1.025	100	1.302	100
9	0.992	100	1.650	100	1.675	100	1.185	100	1.012	100	1.195	100
10	0.793	100	0.853	100	1.691	100	0.893	100	1.206	100	0.982	100
11	1.031	100	0.904	100	2.693	100	0.716	100	1.362	100	0.895	100
12	0.995	100	1.292	100	1.355	100	1.042	100	0.885	100	1.188	100
13	0.868	100	1.756	100	1.297	100	1.282	100	0.922	100	1.398	100
14	0.792	100	0.890	100	1.608	100	0.736	100	1.445	100	0.972	100
15	1.567	100	1.264	100	1.381	100	1.894	100	0.764	100	1.620	100
16	1.432	100	0.979	100	1.721	100	1.492	100	1.784	100	0.922	100
17	1.073	100	1.478	100	1.493	100	0.978	100	0.817	100	1.159	100
18	1.226	100	1.352	100	2.658	100	1.391	100	2.108	100	1.280	100
19	2.148	100	2.203	100	2.902	100	1.919	100	2.999	100	2.560	100
20	1.116	100	1.244	100	2.078	100	1.116	100	1.979	100	1.078	100
21	0.949	100	0.911	100	2.985	100	1.364	100	1.949	100	1.082	100
22	2.165	100	1.946	100	3.655	99.9999	2.114	100	2.964	100	2.287	100
23	1.731	100	1.506	100	2.373	100	1.347	100	2.421	100	1.756	100
24	2.690	100	4.083	98.5642	1.775	100	2.648	100	1.919	100	2.714	100
25	2.121	100	2.108	100	1.829	100	2.303	100	1.635	100	2.516	100
26	1.287	100	1.726	100	1.149	100	1.450	100	0.932	100	1.556	100
27	1.151	100	1.202	100	1.135	100	1.192	100	1.056	100	1.513	100
28	1.012	100	0.997	100	2.137	100	0.855	100	1.394	100	0.988	100
29	0.999	100	2.243	100	1.358	100	1.570	100	0.975	100	1.464	100
30	1.092	100	0.905	100	1.441	100	0.963	100	1.321	100	1.046	100
31	1.348	100	1.433	100	1.316	100	0.889	100	1.096	100	1.240	100
32	0.966	100	1.585	100	1.095	100	1.001	100	1.041	100	1.059	100
135	1.670	100	1.722	100	1.704	100	2.073	100	2.451	100	1.530	100
138	2.534	100	1.794	100	2.552	100	2.020	100	1.426	100	1.751	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	1.543	100	1.580	100	1.675	100	1.249	100	1.279	100	1.384	100
2	0.895	100	0.934	100	0.982	100	1.201	100	1.436	100	1.154	100
3	0.490	100	0.676	100	0.699	100	0.500	100	0.883	100	0.406	100
4	1.164	100	1.090	100	1.379	100	0.869	100	1.515	100	1.551	100
5	1.214	100	1.210	100	1.080	100	0.565	100	1.152	100	1.125	100
6	0.805	100	0.699	100	0.880	100	0.431	100	0.577	100	0.408	100
7	0.906	100	0.850	100	0.890	100	0.784	100	0.689	100	0.668	100
8	0.397	100	0.547	100	0.602	100	0.489	100	0.581	100	0.594	100
9	0.466	100	0.626	100	0.667	100	0.377	100	0.476	100	0.730	100
10	0.415	100	0.399	100	0.448	100	0.537	100	1.052	100	0.542	100
11	0.533	100	0.368	100	0.435	100	0.472	100	1.073	100	0.404	100
12	0.453	100	0.651	100	0.493	100	0.442	100	0.544	100	0.584	100
13	0.774	100	0.939	100	0.704	100	0.594	100	0.855	100	0.577	100
14	1.159	100	0.498	100	0.395	100	0.535	100	0.970	100	0.672	100
15	0.708	100	1.091	100	0.794	100	0.655	100	0.801	100	0.945	100
16	0.496	100	0.630	100	0.588	100	0.757	100	1.003	100	0.680	100
17	1.732	100	0.782	100	1.296	100	0.450	100	0.720	100	0.680	100
18	0.853	100	0.576	100	0.772	100	0.948	100	1.026	100	0.672	100
19	1.576	100	1.434	100	1.521	100	1.661	100	2.186	100	1.746	100
20	0.560	100	0.621	100	0.567	100	0.810	100	0.904	100	0.570	100
21	0.927	100	0.756	100	0.960	100	1.110	100	0.981	100	0.841	100
22	1.821	100	1.362	100	1.603	100	1.955	100	2.164	100	1.643	100
23	1.168	100	1.047	100	1.154	100	1.584	100	1.656	100	1.080	100
24	1.703	100	1.959	100	1.994	100	1.449	100	1.645	100	1.505	100
25	1.469	100	1.881	100	1.376	100	1.257	100	1.304	100	1.400	100
26	0.838	100	0.928	100	0.802	100	0.630	100	0.808	100	0.754	100
27	0.695	100	0.632	100	0.723	100	0.406	100	0.502	100	0.552	100
28	0.566	100	0.418	100	0.495	100	0.619	100	0.691	100	0.505	100
29	0.727	100	1.047	100	0.737	100	0.709	100	0.725	100	0.751	100
30	0.549	100	0.607	100	0.467	100	0.461	100	0.670	100	0.495	100
31	1.326	100	0.958	100	0.469	100	0.412	100	0.793	100	0.959	100
32	0.715	100	0.655	100	0.486	100	0.407	100	0.849	100	0.499	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	1.504	100	1.774	100	1.220	100	1.671	100	1.293	100	1.592	100
2	0.828	100	0.938	100	1.313	100	0.942	100	1.269	100	0.889	100
3	0.839	100	0.633	100	0.562	100	0.758	100	0.474	100	0.679	100
4	0.963	100	1.051	100	0.934	100	1.116	100	0.659	100	1.062	100
5	0.975	100	1.005	100	0.805	100	0.941	100	0.589	100	1.093	100
6	0.602	100	0.786	100	0.430	100	0.839	100	0.397	100	0.779	100
7	0.864	100	0.985	100	0.868	100	0.846	100	0.543	100	0.892	100
8	0.522	100	0.518	100	0.671	100	0.762	100	0.574	100	0.765	100
9	0.606	100	0.691	100	0.477	100	0.637	100	0.427	100	0.668	100
10	0.355	100	0.445	100	0.658	100	0.391	100	0.673	100	0.480	100
11	0.507	100	0.338	100	1.095	100	0.376	100	0.770	100	0.416	100
12	0.637	100	0.610	100	0.621	100	0.526	100	0.510	100	0.665	100
13	0.728	100	0.913	100	0.782	100	0.765	100	0.536	100	0.751	100
14	0.437	100	0.466	100	0.533	100	0.367	100	0.616	100	0.397	100
15	0.927	100	0.728	100	0.685	100	1.115	100	0.486	100	1.016	100
16	0.633	100	0.454	100	0.719	100	0.649	100	0.974	100	0.580	100
17	0.754	100	0.935	100	0.717	100	0.695	100	0.413	100	0.758	100
18	0.666	100	0.976	100	1.203	100	0.769	100	1.310	100	0.841	100
19	1.262	100	1.464	100	1.571	100	1.437	100	2.017	100	1.561	100
20	0.403	100	0.555	100	1.226	100	0.694	100	1.083	100	0.482	100
21	0.483	100	0.556	100	1.558	100	0.719	100	1.147	100	0.656	100
22	1.450	100	1.435	100	2.294	100	1.625	100	2.165	100	1.530	100
23	1.015	100	1.151	100	1.752	100	1.054	100	1.748	100	1.308	100
24	1.929	100	2.335	100	1.564	100	1.780	100	1.359	100	1.782	100
25	1.552	100	1.417	100	1.391	100	1.516	100	1.075	100	1.597	100
26	0.849	100	0.924	100	0.595	100	0.895	100	0.546	100	0.948	100
27	0.661	100	0.764	100	0.570	100	0.663	100	0.443	100	0.705	100
28	0.431	100	0.446	100	1.192	100	0.489	100	0.952	100	0.553	100
29	0.787	100	1.195	100	0.697	100	0.795	100	0.510	100	0.884	100
30	0.529	100	0.510	100	0.523	100	0.511	100	0.600	100	0.470	100
31	0.803	100	0.892	100	0.583	100	0.576	100	0.462	100	0.662	100
32	0.524	100	0.917	100	0.569	100	0.544	100	0.597	100	0.555	100

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

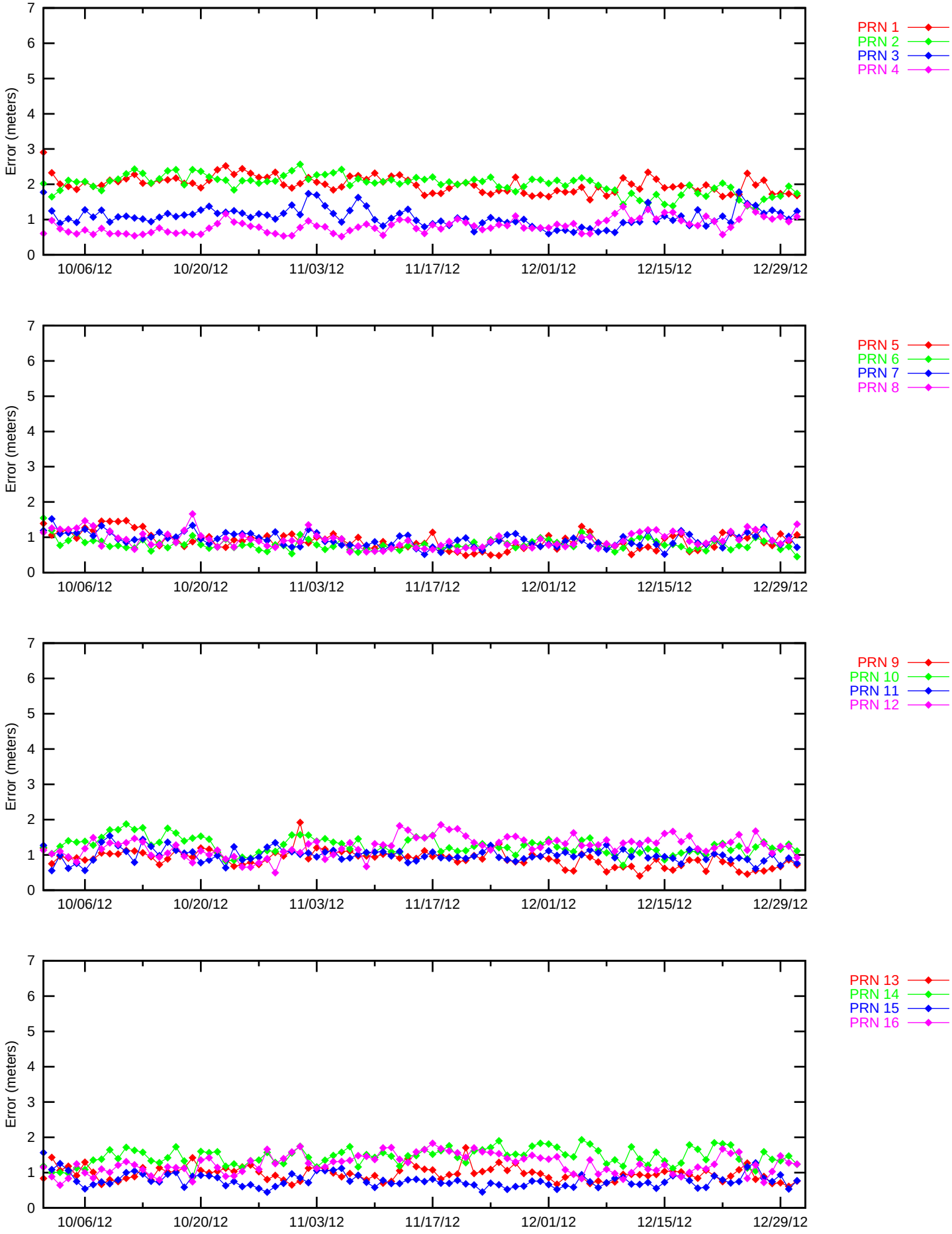


Figure 6-2 95% Range Error (PRN 17 - PRN 32) - Washington DC

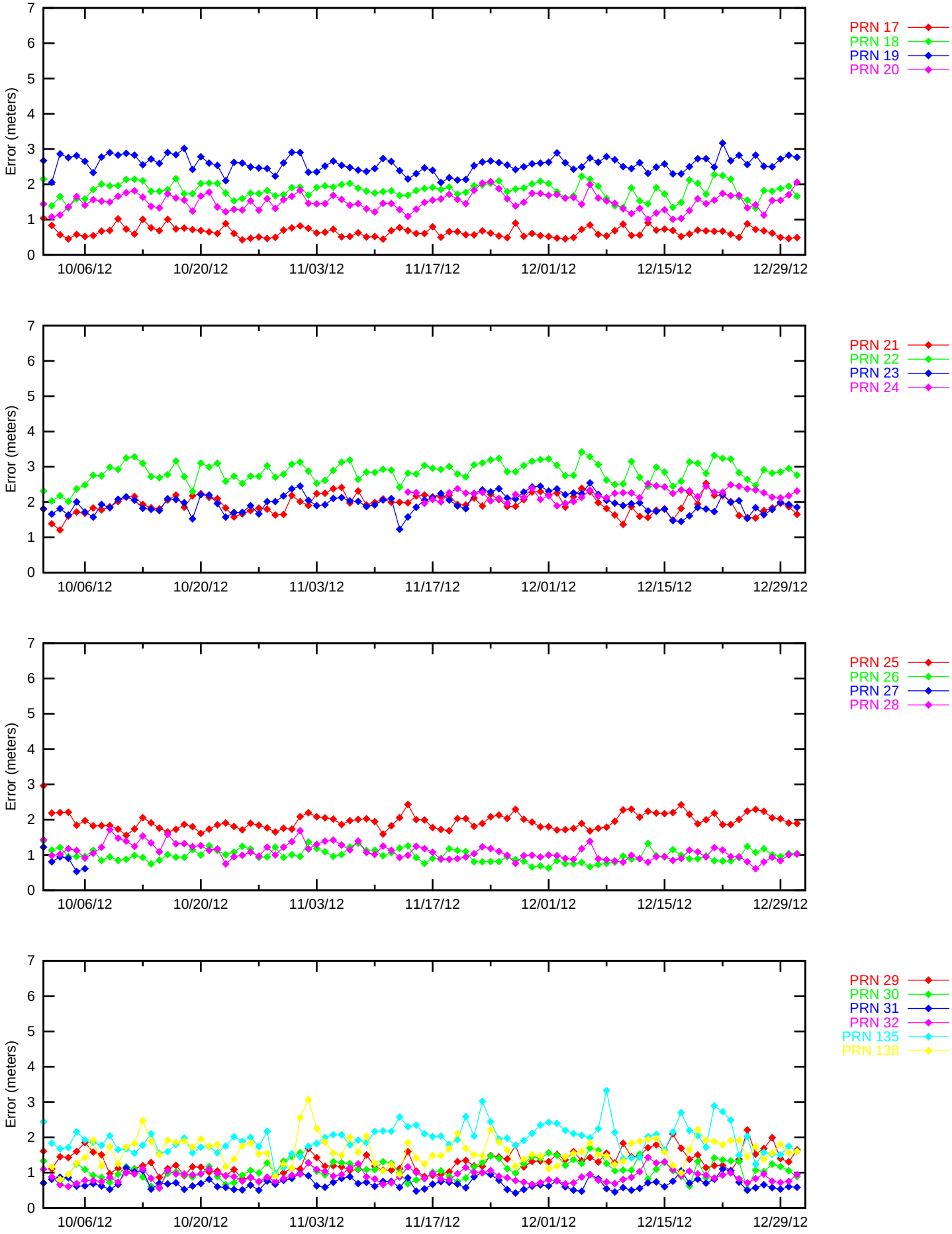


Figure 6-3 95% Ionospheric (PRN 1 - PRN 16) - Washington DC

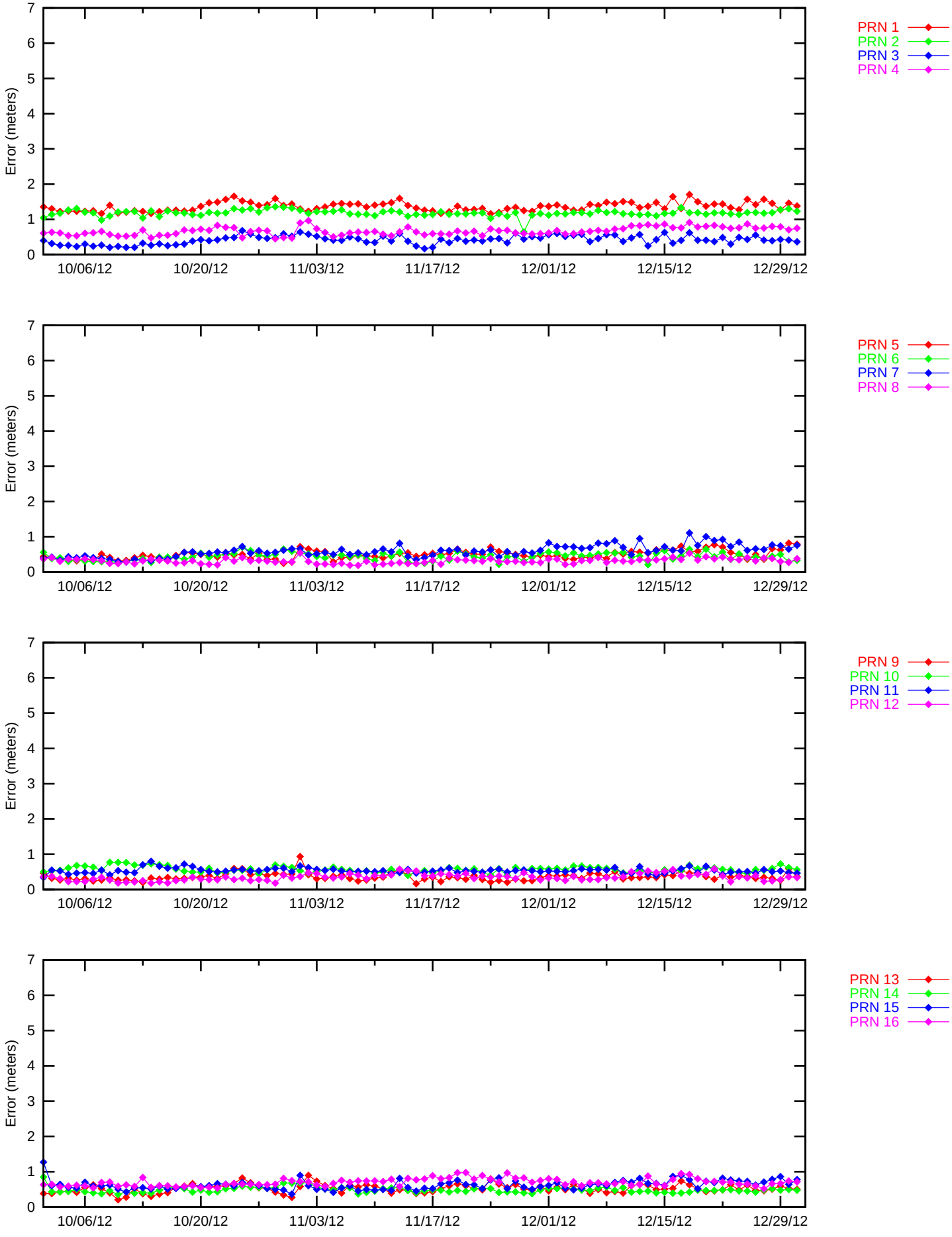
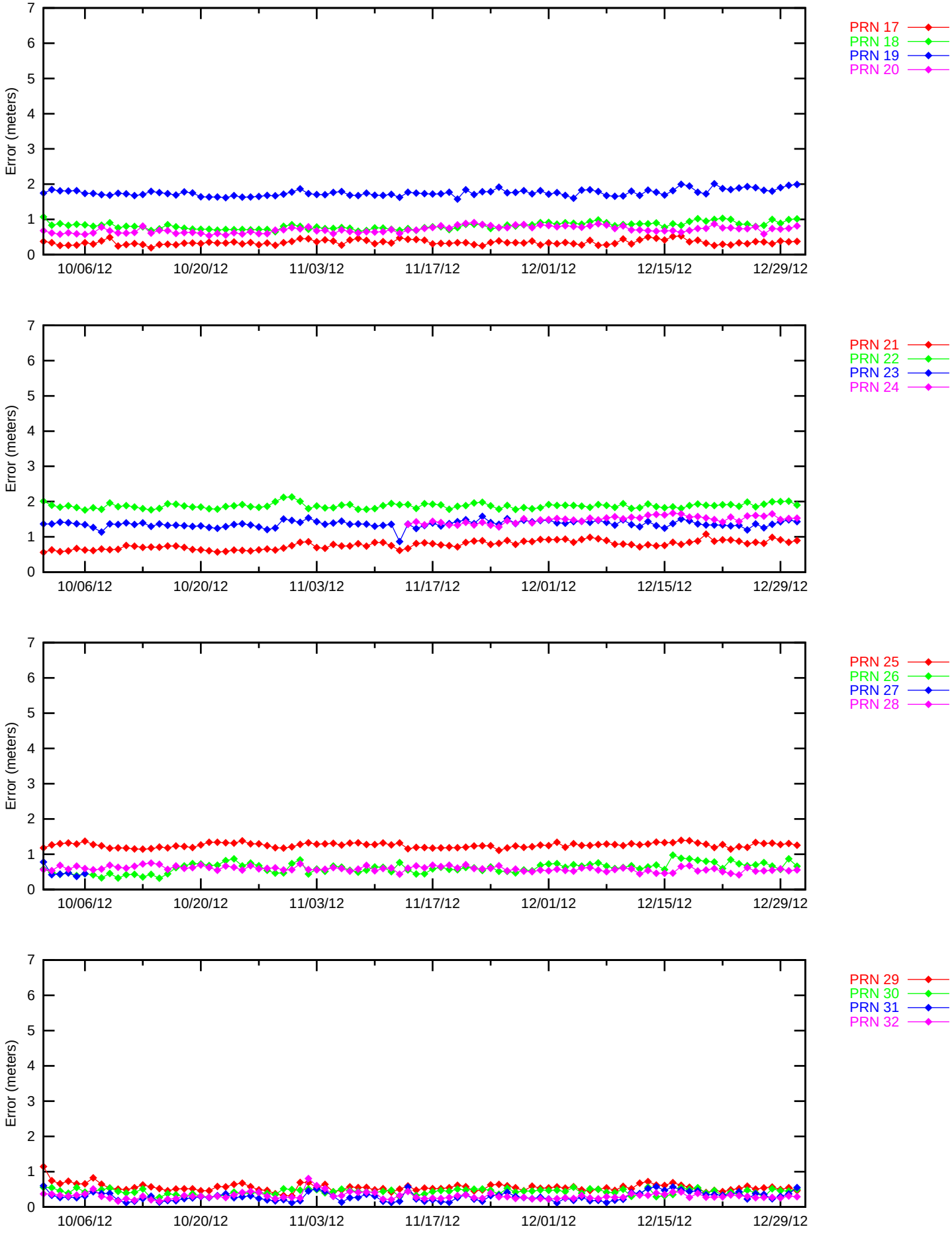


Figure 6-4 95% Ionospheric (PRN 17 - PRN 32) - Washington DC



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	98.61	0.98	0.17	0.24
AMR 133	CRE	98.50	0.87	0.16	0.46
AMR 133	AMR	0	99.84	0.11	0.04
CRW 135	CRW	98.61	0.98	0.17	0.24
CRW 135	CRE	98.51	0.87	0.16	0.46
CRW 135	AMR	0	99.84	0.12	0.04
CRE 138	CRW	98.61	0.98	0.17	0.24
CRE 138	CRE	98.51	0.87	0.16	0.46
CRE 138	AMR	0	99.84	0.12	0.04

Figure 7-1 Daily PA CRW GEO Ranging Availability Trend

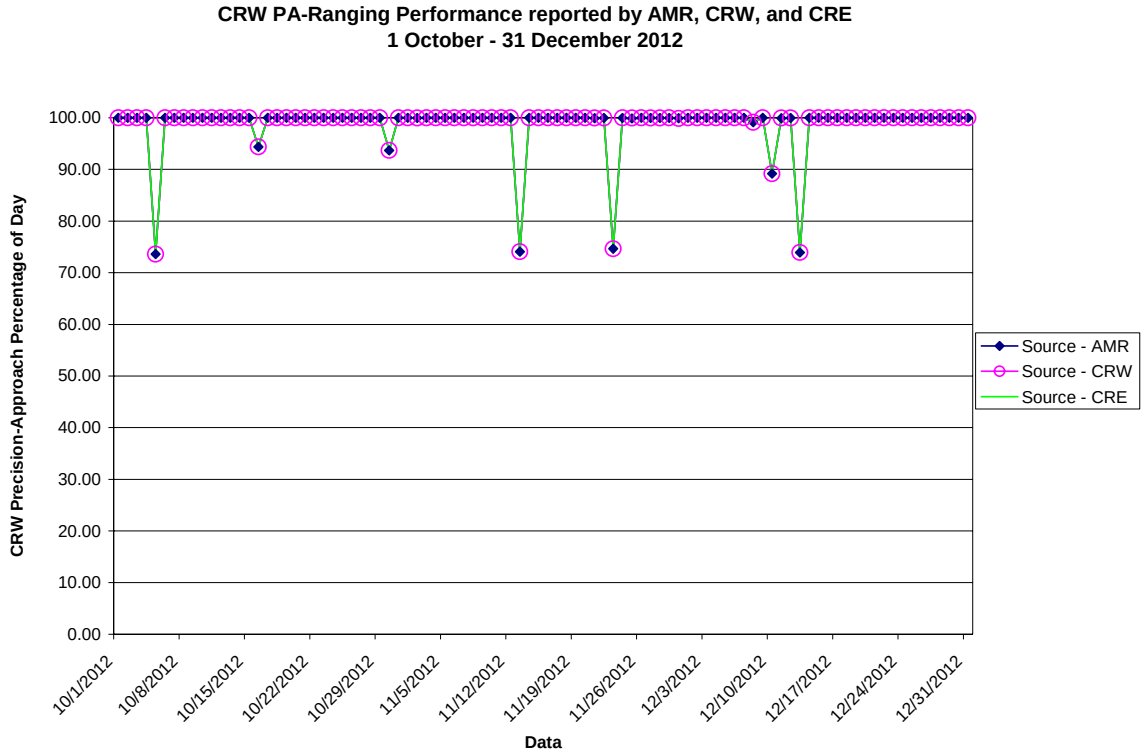


Figure 7-2 Daily PA CRE GEO Ranging Availability Trend

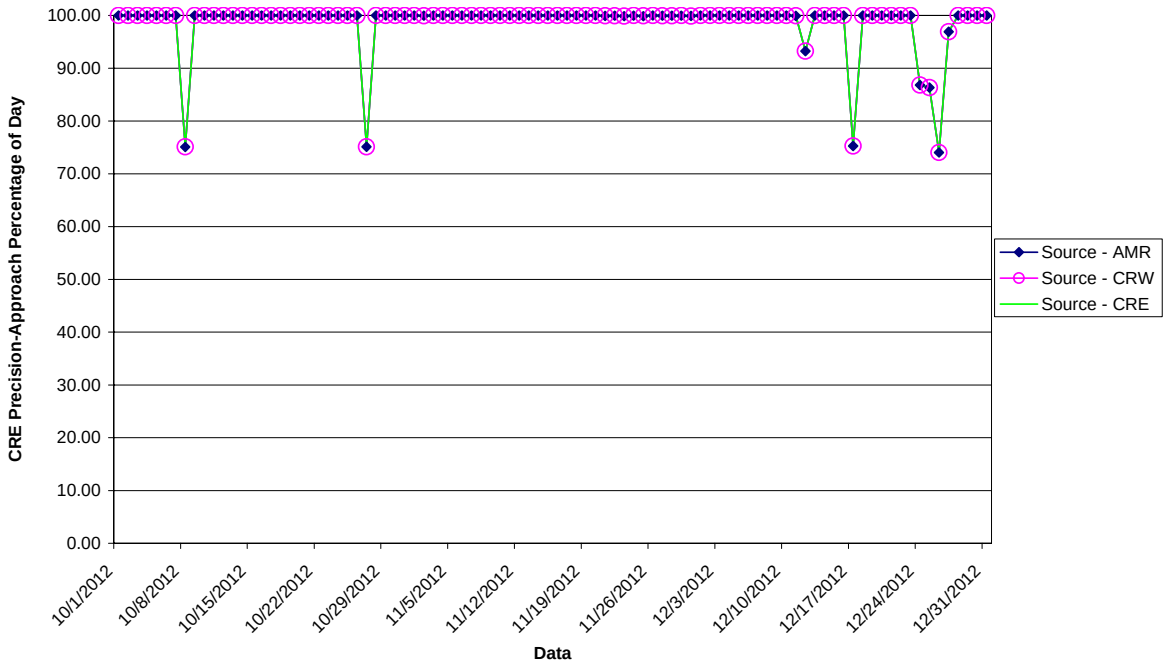
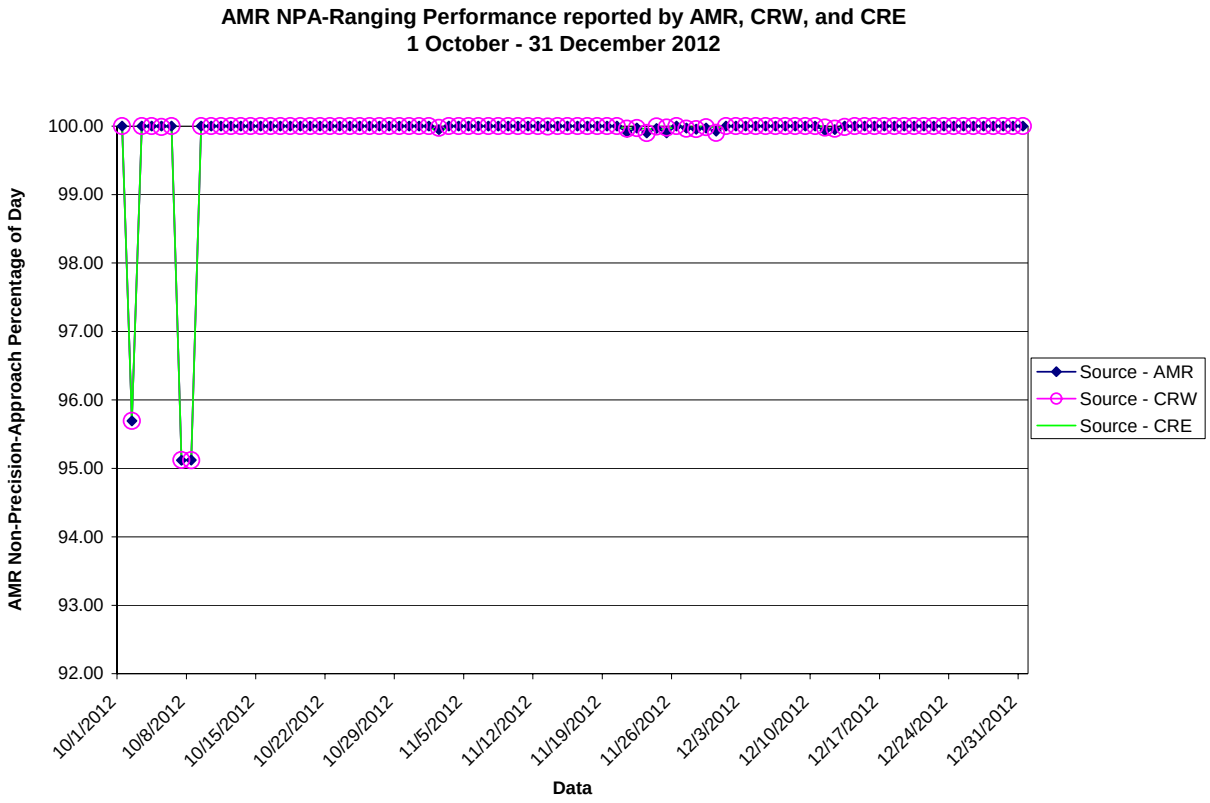


Figure 7-3 Daily NPA AMR GEO Ranging Availability Trend



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
CYXD	Edmonton City Ctr	AB	LPV	0	1	1	0.9999	4	0.9994
CYEG	Edmonton / Josephburg	AB	LPV	0	1	1	0.9999	3	0.9994
CEV3	Vegreville	AB	LPV	0	1	1	0.9999	3	0.9994
CAL4	Fort Mackay / Albian Aerodrome	AB	LPV	1	1	2	0.9998	5	0.9985
GKN	GULKANA	AK	LPV	1	0.9992	3	0.9986	6	0.998
MCG	MCGRATH	AK	LP	3	0.999	4	0.9989	6	0.9982
YAK	YAKUTAT	AK	LPV200	1	0.9991	2	0.9988	6	0.9981
DLG	DILLINGHAM	AK	LPV	1	0.9994	1	0.9993	7	0.9988
AQH	QUINHAGAK	AK	LPV	1	0.9994	1	0.9993	18	0.9986
ORT	NORTHWAY	AK	LP	1	0.9992	6	0.9984	7	0.9975
OTZ	RALPH WIEN MEMORIAL	AK	LPV200	6	0.9982	7	0.9979	59	0.9924
FAI	FAIRBANKS INTL	AK	LPV200	3	0.999	3	0.9983	7	0.9974
HLA	HUSLIA	AK	LPV	3	0.9986	4	0.9985	7	0.9975
MDO	MIDDLETON ISLAND	AK	LP	1	0.999	1	0.999	5	0.9986
9A3	CHUATHBALUK	AK	LPV	2	0.9991	2	0.999	4	0.9987
CDB	COLD BAY	AK	LPV	1	0.9996	3	0.9994	341	0.9472
ELI	ELIM	AK	LPV	2	0.9989	3	0.9985	8	0.9981
HPB	HOOPER BAY	AK	LP	2	0.9991	2	0.9989	28	0.997
KAL	KALTAG	AK	LPV	3	0.9989	4	0.9986	8	0.9983

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BET	BETHEL	AK	LPV200	2	0.9993	2	0.9991	7	0.9986
2C7	SHAKTOOLIK	AK	LPV	2	0.9989	3	0.9985	8	0.9983
KTN	KETCHIKAN INTL	AK	LPV	2	0.9994	2	0.9994	2	0.9987
HOM	HOMER	AK	LPV	1	0.9992	2	0.9991	6	0.9989
ENA	KENAI MUNI	AK	LPV200	1	0.9991	2	0.999	7	0.9986
MDM	MARSHALL DON HUNTER SR	AK	LP	2	0.999	2	0.9989	5	0.9985
6A8	ALLAKAKET	AK	LP	5	0.9984	7	0.9981	7	0.9969
SMK	ST MICHAEL	AK	LPV	2	0.9989	3	0.9987	6	0.9983
RBY	RUBY	AK	LPV	3	0.9986	4	0.9985	7	0.9977
ILI	ILIAMNA	AK	LPV	1	0.9992	2	0.9992	4	0.9988
GAL	EDWARD G. PITKA	AK	LPV	3	0.9986	4	0.9985	7	0.9978
CLP	CLARKS POINT	AK	LPV	1	0.9994	1	0.9993	6	0.9988
WNA	NAPAKIAK	AK	LPV	1	0.9993	2	0.9992	7	0.9986
KWT	KWETHLUK	AK	LPV	2	0.9993	2	0.9991	6	0.9986
WLK	SELAWIK	AK	LPV	3	0.9986	4	0.9981	11	0.9971
SHX	SHAGELUK	AK	LPV	2	0.9989	3	0.9988	4	0.9985
7KA	TATITLEK	AK	LP	1	0.9992	1	0.999	7	0.9985
KSM	ST MARY'S	AK	LPV200	2	0.999	2	0.9988	6	0.9984
SCM	SCAMMON BAY	AK	LP	2	0.999	2	0.9988	20	0.9976
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	1	0.9991	2	0.999	7	0.9984
AQT	NUIQSUT	AK	LPV	3	0.9981	4	0.9974	7	0.9963
AKN	KING SALMON	AK	LPV	1	0.9994	2	0.9993	3	0.9988
ENM	EMMONAK	AK	LPV	2	0.9989	3	0.9988	13	0.9981
OOK	TOKSOOK BAY	AK	LP	2	0.9994	2	0.9992	35	0.9969
PAQ	PALMER MUNI	AK	LP	1	0.9991	2	0.9991	7	0.9982
SCC	DEADHORSE	AK	LPV	4	0.9981	3	0.9974	7	0.9963
CXF	COLDFOOT	AK	LP	3	0.998	4	0.9974	6	0.9968
BRW	WILEY POST-WILL ROGERS MEM	AK	LPV	5	0.9979	6	0.9974	140	0.9878
UNK	UNALAKLEET	AK	LP	2	0.9989	3	0.9986	6	0.9984
SHG	SHUNGNAK	AK	LP	4	0.9984	5	0.9982	9	0.997
KYU	KOYUKUK	AK	LPV	3	0.9986	4	0.9985	8	0.9978
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	5	0.9983	6	0.9979	40	0.9936
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	1	0	1	0	1
1M4	POSEY FIELD	AL	LPV	0	1	0	1	0	1
DCU	PRYOR FIELD REGIONAL	AL	LPV200	0	1	0	1	0	1
79J	SOUTH ALABAMA RGNL AT BILL BENTON FIELD	AL	LPV	0	1	0	1	0	1
TCL	TUSCALOOSA REGIONAL	AL	LPV	0	1	0	1	0	1
TOI	TROY MUNI	AL	LPV	0	1	0	1	0	1
HSV	HUNTSVILLE INTL-CARL T JONES FLD	AL	LPV200	0	1	0	1	0	1
8A0	ALBERTVILLE MUNI-T. J. BRUMLIK FIELD	AL	LPV	0	1	0	1	0	1
MGM	MONTGOMERY REGIONAL (DANNELLY FIELD)	AL	LPV200	0	1	0	1	0	1
GAD	NORTHEAST ALABAMA REGIONAL	AL	LPV200	0	1	0	1	0	1
JKA	JACK EDWARDS	AL	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
SEM	CRAIG FIELD	AL	LPV	0	1	0	1	0	1
PLR	ST CLAIR COUNTY	AL	LPV	0	1	0	1	0	1
SCD	MERKEL FIELD SYLACAUGA MUNI	AL	LPV	0	1	0	1	0	1
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	1	0	1	0	1
ASN	TALLADEGA MUNICIPAL	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
EDN	ENTERPRISE MUNI	AL	LPV	0	1	0	1	0	1
EET	SHELBY COUNTY	AL	LPV	0	1	0	1	0	1
1R8	BAY MINETTE MUNI	AL	LPV	0	1	0	1	0	1
3A1	FOLSOM FIELD	AL	LPV	0	1	0	1	0	1
EKY	BESSEMER	AL	LPV	0	1	0	1	0	1
0J6	HEADLAND MUNI	AL	LPV	0	1	0	1	0	1
ANB	ANNISTON METROPOLITAN	AL	LPV	0	1	0	1	0	1
CQF	H L SONNY CALLAHAN	AL	LPV200	0	1	0	1	0	1
MDQ	MADISON COUNTY EXECUTIVE/TOM SHARP JR FLD	AL	LPV	0	1	0	1	0	1
PYP	CENTRE-PIEDMONT CHEROKEE COUNTY RGNL	AL	LPV	0	1	0	1	0	1
12J	BREWTON MUNI	AL	LPV	0	1	0	1	0	1
4A9	ISBELL FIELD	AL	LPV	0	1	0	1	0	1
DHN	DOTHAN REGIONAL	AL	LPV	0	1	0	1	0	1
MSL	NORTHWEST ALABAMA REGIONAL	AL	LPV200	0	1	0	1	0	1
M95	RICHARD ARTHUR FIELD	AL	LPV	0	1	0	1	0	1
EUF	WEEDON FIELD	AL	LPV	0	1	0	1	0	1
MOB	MOBILE REGIONAL	AL	LPV	0	1	0	1	0	1
2R5	ST ELMO	AL	LPV	0	1	0	1	0	1
5R4	FOLEY MUNI	AL	LPV	0	1	0	1	0	1
AUO	AUBURN-OPELIKA ROBERT G PITTS	AL	LPV	0	1	0	1	0	1
06A	MOTON FIELD MUNI	AL	LPV	0	1	0	1	0	1
BPK	OZARK REGIONAL	AR	LPV	0	1	0	1	0	1
XNA	NORTHWEST ARKANSAS REGIONAL	AR	LPV200	0	1	0	1	0	1
M19	NEWPORT MUNI	AR	LPV	0	1	0	1	0	1
FSM	FORT SMITH RGNL	AR	LPV200	0	1	0	1	0	1
HRO	BOONE COUNTY	AR	LPV	0	1	0	1	0	1
PBF	GRIDER FIELD	AR	LPV	0	1	0	1	0	1
ROG	ROGERS MUNI-CARTER FIELD	AR	LPV	0	1	0	1	0	1
CDH	HARRELL FIELD	AR	LPV	0	1	0	1	0	1
M77	HOWARD COUNTY	AR	LP	0	1	0	1	0	1
4M3	CARLISLE MUNI	AR	LPV	0	1	0	1	0	1
SLG	SMITH FIELD	AR	LPV	0	1	0	1	0	1
SUZ	SALINE COUNTY REGIONAL	AR	LPV	0	1	0	1	0	1
ASG	SPRINGDALE MUNI	AR	LPV	0	1	0	1	0	1
SGT	STUTTGART MUNI	AR	LPV	0	1	0	1	0	1
TXK	TEXARKANA REGIONAL-WEBB FIELD	AR	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
LIT	ADAMS FIELD	AR	LPV200	0	1	0	1	0	1
RUE	RUSSELLVILLE REGIONAL	AR	LPV	0	1	0	1	0	1
JBR	JONESBORO MUNI	AR	LPV	0	1	0	1	0	1
BVX	BATESVILLE REGIONAL	AR	LPV	0	1	0	1	0	1
SRC	SEARCY MUNI	AR	LPV	0	1	0	1	0	1
ARG	WALNUT RIDGE REGIONAL	AR	LPV200	0	1	0	1	0	1
ELD	SOUTH ARKANSAS REGIONAL AT GOODWIN FIELD	AR	LPV	0	1	0	1	0	1
ORK	NORTH LITTLE ROCK MUNI	AR	LPV	0	1	0	1	0	1
BYH	ARKANSAS INTERNATIONAL	AR	LPV200	0	1	0	1	0	1
7M1	MC GEHEE MUNI	AR	LP	0	1	0	1	0	1
AWM	WEST MEMPHIS MUNI	AR	LPV200	0	1	0	1	0	1
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	1	0	1	1	1
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	1	0	1	1	0.9999
GEU	GLENDALE MUNI	AZ	LPV	0	1	0	1	13	0.9998
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	1	0	1	6	0.9999
PRC	ERNEST A. LOVE FIELD	AZ	LPV	0	1	0	1	1	1
SOW	SHOW LOW REGIONAL	AZ	LPV	0	1	0	1	1	0.9999
TUS	TUCSON INTL	AZ	LPV	0	1	0	1	35	0.9989
P33	COCHISE COUNTY	AZ	LPV	0	1	0	1	11	0.9998
FFZ	FALCON FLD	AZ	LP	0	1	0	1	8	0.9997
FHU	SIERRA VISTA MUNI-LIBBY AAF	AZ	LPV200	0	1	0	1	40	0.9987
HII	LAKE HAVASU CITY	AZ	LPV	0	1	0	1	1	0.9999
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	1	0	1	11	0.9997
RQE	WINDOW ROCK	AZ	LP	0	1	0	1	1	1
AVQ	MARANA REGIONAL	AZ	LP	0	1	0	1	32	0.9991
PGA	PAGE MUNI	AZ	LPV	0	1	0	1	0	1
IGM	KINGMAN	AZ	LPV	0	1	0	1	0	1
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	1	0	1	13	0.9997
SAD	SAFFORD REGIONAL	AZ	LPV	0	1	0	1	1	0.9999
D68	SPRINGERVILLE MUNI	AZ	LP	0	1	0	1	1	0.9999
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	1	0	1	0	1
CYXS	Prince George	BC	LPV	0	1	0	1	5	0.999
CYYJ	Victoria Intl	BC	LPV	0	1	0	1	4	0.9998
CYBL	Campbell River	BC	LPV	0	1	0	1	5	0.9997
CZBB	Vancouver / Boundary Bay	BC	LPV	0	1	0	1	4	0.9998
CYVR	Vancouver Intl	BC	LPV	0	1	0	1	4	0.9998
CYCD	Nanaimo	BC	LPV	0	1	0	1	3	0.9998
PRB	PASO ROBLES MUNICIPAL	CA	LPV200	0	1	5	1	95	0.9925
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	1	0	1	3	0.9998
SMX	SANTA MARIA PUBLIC/CAPT G ALLAN HANCOCK FIELD	CA	LPV200	0	1	12	0.9998	97	0.9922
CEC	JACK MC NAMARA FIELD	CA	LPV	0	1	1	1	96	0.983
MYF	MONTGOMERY FIELD	CA	LPV200	0	1	0	1	3	0.9996
POC	BRACKETT FIELD	CA	LPV	0	1	0	1	3	0.9997
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	1	1	1	90	0.9953
PVF	PLACERVILLE	CA	LPV	0	1	0	1	77	0.9955

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
LGB	LONG BEACH/DAUGHERTY FIELD	CA	LPV	0	1	0	1	3	0.9996
SAN	SAN DIEGO INTL	CA	LP	0	1	0	1	3	0.9996
SBP	SAN LUIS COUNTY REGIONAL	CA	LPV200	0	1	15	0.9998	97	0.9913
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	1	0	1	3	0.9997
CIC	CHICO MUNI	CA	LPV	0	1	1	1	93	0.9913
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	1	0	1	51	0.9988
RHV	REID-HILLVIEW OF SANTA CLARA	CA	LPV	0	1	10	0.9998	95	0.9879
SFO	SAN FRANCISCO INTERNATIONAL	CA	LPV	0	1	12	0.9997	95	0.9863
LAX	LOS ANGELES INTL	CA	LPV	0	1	0	1	3	0.9996
MRY	MONTEREY PENINSULA	CA	LPV	0	1	16	0.9997	96	0.9876
RAL	RIVERSIDE MUNI	CA	LPV	0	1	0	1	3	0.9997
SCK	STOCKTON METROPOLITAN	CA	LPV	0	1	1	1	94	0.991
FAT	FRESNO YOSEMITE INTL	CA	LPV	0	1	0	1	71	0.9979
ACV	ARCATA	CA	LPV200	0	1	1	0.9999	95	0.983
LVK	LIVERMORE MUNI	CA	LPV	0	1	5	0.9999	95	0.9879
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	1	1	1	94	0.9884
SBA	SANTA BARBARA MUNI	CA	LPV	0	1	1	0.9999	96	0.9956
TCY	TRACY MUNI	CA	LPV	0	1	2	0.9999	95	0.9895
CMA	CAMARILLO	CA	LPV	0	1	1	1	44	0.9988
VCB	NUT TREE	CA	LPV	0	1	2	0.9999	95	0.9878
VIS	VISALIA MUNI	CA	LPV200	0	1	0	1	51	0.9986
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	1	0	1	3	0.9998
SNS	SALINAS MUNI	CA	LPV200	0	1	10	0.9998	95	0.9884
STS	CHARLES M. SCHULZ-SONOMA COUNTY	CA	LPV	0	1	8	0.9998	95	0.9853
HAF	HALF MOON BAY	CA	LPV	0	1	12	0.9996	95	0.9861
OVE	OROVILLE MUNI	CA	LPV	0	1	1	1	93	0.9917
CNO	CHINO	CA	LPV	0	1	0	1	3	0.9997
DAG	BARSTOW-DAGGETT	CA	LPV	0	1	0	1	3	0.9999
HHR	HAWTHORNE JACK NORTHROP FIELD	CA	LPV	0	1	0	1	3	0.9996
DWA	YOLO COUNTY-DAVIS/WOODLAND/WINTERS	CA	LPV	0	1	1	1	95	0.9887
SNA	JOHN WAYNE-ORANGE COUNTY	CA	LPV	0	1	0	1	3	0.9997
MHR	SACRAMENTO MATHER	CA	LPV200	0	1	1	1	93	0.9921
OAK	METROPOLITAN OAKLAND INTL	CA	LPV	0	1	10	0.9998	95	0.9867
ONT	ONTARIO INTL	CA	LPV	0	1	0	1	3	0.9997
SAC	SACRAMENTO EXECUTIVE	CA	LPV200	0	1	1	1	93	0.9906
APC	NAPA COUNTY	CA	LPV	0	1	4	0.9999	95	0.9866
AUN	AUBURN MUNI	CA	LPV	0	1	0	1	85	0.9944
MAE	MADERA MUNI	CA	LPV	0	1	1	1	90	0.9967
RBL	RED BLUFF MUNI	CA	LPV	0	1	1	1	94	0.9906
RDD	REDDING MUNI	CA	LPV	0	1	1	1	93	0.9908
LHM	LINCOLN REGIONAL/KARL HARDER FIELD	CA	LPV200	0	1	1	1	92	0.992
O27	OAKDALE	CA	LPV	0	1	1	1	92	0.9945

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
O88	RIO VISTA MUNI	CA	LP	0	1	2	0.9999	95	0.9886
SJC	NORMAN Y. MINETA SAN JOSE INTERNATIONAL	CA	LPV	0	1	10	0.9998	95	0.9875
CCR	BUCHANAN FIELD	CA	LPV	0	1	4	0.9999	95	0.9872
OXR	OXNARD	CA	LPV	0	1	1	1	51	0.9986
BFL	MEADOWS FIELD	CA	LPV200	0	1	0	1	38	0.9992
BLH	BLYTHE	CA	LP	0	1	0	1	1	0.9999
HWD	HAYWARD EXECUTIVE	CA	LPV	0	1	9	0.9998	95	0.987
LSN	LOS BANOS MUNI	CA	LPV	0	1	1	1	95	0.9926
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	1	1	1	94	0.9928
MYV	YUBA COUNTY	CA	LPV200	0	1	1	1	92	0.9914
CVH	HOLLISTER MUNI	CA	LPV	0	1	10	0.9998	95	0.9893
PMD	PALMDALE REGIONAL/USAF PLANT 42	CA	LPV200	0	1	0	1	3	0.9997
O69	PETALUMA MUNI	CA	LPV	0	1	6	0.9999	95	0.9857
SEE	GILLESPIE FIELD	CA	LP	0	1	0	1	3	0.9997
SMF	SACRAMENTO INTL	CA	LPV200	0	1	1	1	93	0.9901
APV	APPLE VALLEY	CA	LPV	0	1	0	1	3	0.9998
C83	BYRON	CA	LPV	0	1	2	0.9999	95	0.9888
MER	CASTLE	CA	LPV200	0	1	1	1	90	0.995
O02	NERVINO	CA	LPV	0	1	0	1	35	0.9989
AAT	ALTURAS MUNI	CA	LPV	0	1	0	1	26	0.9995
TEX	TELLURIDE REGIONAL	CO	LP	0	1	0	1	0	1
GXY	GREELEY-WELD COUNTY	CO	LPV	0	1	0	1	0	1
FTG	FRONT RANGE	CO	LPV	0	1	0	1	0	1
MTJ	MONTROSE REGIONAL	CO	LPV	0	1	0	1	0	1
RIL	GARFIELD COUNTY REGIONAL	CO	LPV	0	1	0	1	0	1
ALS	SAN LUIS VALLEY REGIONAL/BERGMAN FIELD	CO	LPV200	0	1	0	1	0	1
PUB	PUEBLO MEMORIAL	CO	LPV200	0	1	0	1	0	1
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	1	0	1	0	1
GJT	GRAND JUNCTION RGNL	CO	LPV200	0	1	0	1	0	1
FNL	FORT COLLINS-LOVELAND MUNI	CO	LPV200	0	1	0	1	0	1
DEN	DENVER INTERNATIONAL	CO	LPV200	0	1	0	1	0	1
LHX	LA JUNTA MUNI	CO	LPV	0	1	0	1	0	1
APA	CENTENNIAL	CO	LPV	0	1	0	1	0	1
ITR	KIT CARSON COUNTY	CO	LPV	0	1	0	1	0	1
HDN	YAMPA VALLEY	CO	LPV	0	1	0	1	0	1
LAA	LAMAR MUNI	CO	LPV	0	1	0	1	0	1
CEZ	CORTEZ MUNI	CO	LPV	0	1	0	1	0	1
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	1	0	1	0	1
COS	CITY OF COLORADO SPRINGS MUNI	CO	LPV200	0	1	0	1	0	1
HVN	TWEED-NEW HAVEN	CT	LPV	0	1	0	1	0	1
OXC	WATERBURY-OXFORD	CT	LPV	0	1	0	1	0	1
GON	GROTON-NEW LONDON	CT	LPV	0	1	0	1	0	1
IJD	WINDHAM	CT	LP	0	1	0	1	0	1
BDL	BRADLEY INTL	CT	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
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	1	0	1	0	1
DCA	RONALD REAGAN WASHINGTON NATL	DC	LPV	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
40J	PERRY-FOLEY	FL	LPV	0	1	0	1	0	1
CEW	BOB SIKES	FL	LPV	0	1	0	1	0	1
FHB	FERNANDINA BEACH MUNI	FL	LPV	0	1	0	1	0	1
MKY	MARCO ISLAND	FL	LPV	0	1	0	1	0	1
X14	LA BELLE MUNI	FL	LPV	0	1	0	1	0	1
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	0	1	0	1	0	1
VNC	VENICE MUNI	FL	LP	0	1	0	1	0	1
TPA	TAMPA INTL	FL	LPV200	0	1	0	1	0	1
OBE	OKEECHOBEE COUNTY	FL	LPV	0	1	0	1	0	1
PNS	PENSACOLA RGNL	FL	LPV	0	1	0	1	0	1
FMY	PAGE FIELD	FL	LPV	0	1	0	1	0	1
DAB	DAYTONA BEACH INTL	FL	LPV200	0	1	0	1	0	1
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	1	0	1	0	1
CTY	CROSS CITY	FL	LPV	0	1	0	1	0	1
PHK	PALM BEACH COUNTY GLADES	FL	LPV	0	1	0	1	0	1
VDF	TAMPA EXECUTIVE	FL	LPV	0	1	0	1	0	1
ZPH	ZEPHYRHILLS MUNI	FL	LPV	0	1	0	1	0	1
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV	0	1	0	1	15	0.9996
GNV	GAINESVILLE RGNL	FL	LPV	0	1	0	1	0	1
54J	DEFUNIAK SPRINGS	FL	LP	0	1	0	1	0	1
SUA	WITHAM FIELD	FL	LPV	0	1	0	1	2	1
X51	HOMESTEAD GENERAL AVIATION	FL	LPV	0	1	0	1	30	0.9993
GIF	WINTER HAVEN'S GILBERT	FL	LPV	0	1	0	1	0	1
JAX	JACKSONVILLE INTL	FL	LPV200	0	1	0	1	0	1
CRG	CRAIG MUNI	FL	LPV200	0	1	0	1	0	1
LCQ	LAKE CITY MUNI	FL	LPV	0	1	0	1	0	1
DTS	DESTIN-FORT WALTON BEACH	FL	LP	0	1	0	1	0	1
TPF	PETER O KNIGHT	FL	LP	0	1	0	1	0	1
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	1	0	1	0	1
LEE	LEESBURG INTL	FL	LPV	0	1	0	1	0	1
PIE	ST PETERSBURG-CLEARWATER INTL	FL	LPV200	0	1	0	1	0	1
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	1	0	1	0	1
EYW	KEY WEST INTL	FL	LPV	0	1	0	1	14	0.9994
IMM	IMMOKALEE RGNL	FL	LPV	0	1	0	1	0	1
HEG	HERLONG RECREATIONAL	FL	LP	0	1	0	1	0	1
ORL	ORLANDO EXECUTIVE	FL	LPV200	0	1	0	1	0	1
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	1	0	1	0	1
BOW	BARTOW MUNI	FL	LPV	0	1	0	1	0	1
VQQ	CECIL FIELD	FL	LPV	0	1	0	1	0	1
X07	LAKE WALES MUNI	FL	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
XFL	FLAGLER COUNTY	FL	LPV	0	1	0	1	0	1
MIA	MIAMI INTL	FL	LPV	0	1	0	1	31	0.9993
F45	NORTH PALM BEACH COUNTY GENERAL AVIATION	FL	LPV	0	1	0	1	4	1
28J	PALATKA MUNICIPAL ARPT	FL	LPV	0	1	0	1	0	1
PBI	PALM BEACH INTL	FL	LPV200	0	1	0	1	6	0.9999
APF	NAPLES MUNI	FL	LPV	0	1	0	1	0	1
PCM	PLANT CITY MUNI	FL	LPV	0	1	0	1	0	1
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	1	0	1	0	1
OPF	OPA LOCKA	FL	LPV200	0	1	0	1	18	0.9996
FXE	FT LAUDERDALE EXECUTIVE	FL	LPV200	0	1	0	1	12	0.9997
AAF	APALACHICOLA MUNI	FL	LPV	0	1	0	1	0	1
AVO	AVON PARK EXECUTIVE	FL	LPV	0	1	0	1	0	1
DED	DELAND MUNI-SIDNEY H TAYLOR FLD	FL	LPV	0	1	0	1	0	1
VRB	VERO BEACH MUNI	FL	LPV	0	1	0	1	0	1
SGJ	ST AUGUSTINE	FL	LPV	0	1	0	1	0	1
LAL	LAKELAND LINDER REGIONAL	FL	LPV200	0	1	0	1	0	1
MCO	ORLANDO INTL	FL	LPV200	0	1	0	1	0	1
MLB	MELBOURNE INTL	FL	LPV	0	1	0	1	0	1
MTH	THE FLORIDA KEYS MARATHON	FL	LPV	0	1	0	1	31	0.999
BCT	BOCA RATON	FL	LPV	0	1	0	1	9	0.9998
COI	MERRITT ISLAND	FL	LPV	0	1	0	1	0	1
1J0	TRI-COUNTY	FL	LP	0	1	0	1	0	1
SEF	SEBRING REGIONAL	FL	LPV	0	1	0	1	0	1
TIX	SPACE COAST REGIONAL	FL	LPV200	0	1	0	1	0	1
TLH	TALLAHASSEE REGIONAL	FL	LPV	0	1	0	1	0	1
TMB	KENDALL-TAMIAMI EXECUTIVE	FL	LPV200	0	1	0	1	27	0.9993
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	1	0	1	12	0.9997
EVB	NEW SMYRNA BEACH MUNI	FL	LPV	0	1	0	1	0	1
FPR	ST LUCIE COUNTY INTL	FL	LPV	0	1	0	1	0	1
PGD	CHARLOTTE COUNTY	FL	LPV200	0	1	0	1	0	1
X35	MARION CO & PARK OF COMMERCE	FL	LP	0	1	0	1	0	1
BKV	HERNANDO COUNTY	FL	LPV	0	1	0	1	0	1
AGS	AUGUSTA REGIONAL AT BUSH FIELD	GA	LPV	0	1	0	1	0	1
DNN	DALTON MUNI	GA	LPV	0	1	0	1	0	1
MAC	MACON DOWNTOWN	GA	LP	0	1	0	1	0	1
CTJ	WEST GEORGIA REGIONAL-O V GRAY FIELD	GA	LPV	0	1	0	1	0	1
WDR	WINDER-BARROW	GA	LPV	0	1	0	1	0	1
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	1	0	1	0	1
RYY	COBB COUNTY-MC COLLUM FIELD	GA	LPV200	0	1	0	1	0	1
GVL	LEE GILMER MEMORIAL	GA	LPV	0	1	0	1	0	1
BHC	BAXLEY MUNI	GA	LPV	0	1	0	1	0	1
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	1	0	1	0	1
48A	COCHRAN	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
4J6	ST MARYS	GA	LPV	0	1	0	1	0	1
ATL	HARTSFIELD - JACKSON ATLANTA INTL	GA	LPV200	0	1	0	1	0	1
BGE	DECATUR COUNTY INDUSTRIAL AIR PARK	GA	LPV200	0	1	0	1	0	1
BIJ	EARLY COUNTY	GA	LPV	0	1	0	1	0	1
CNI	CHEROKEE COUNTY	GA	LPV	0	1	0	1	0	1
AYS	WAYCROSS-WARE COUNTY	GA	LPV	0	1	0	1	0	1
70J	CAIRO-GRADY COUNTY	GA	LPV	0	1	0	1	0	1
TMA	HENRY TIFTON MYERS	GA	LPV	0	1	0	1	0	1
52A	MADISON MUNI	GA	LP	0	1	0	1	0	1
PIM	HARRIS COUNTY	GA	LPV	0	1	0	1	0	1
RMG	RICHARD B RUSSELL	GA	LPV	0	1	0	1	0	1
FZG	FITZGERALD MUNI	GA	LPV	0	1	0	1	0	1
3J7	GREENE COUNTY REGIONAL	GA	LPV	0	1	0	1	0	1
4A4	POLK COUNTY AIRPORT CORNELIUS MOORE FIELD	GA	LPV	0	1	0	1	0	1
ABY	SOUTHWEST GEORGIA REGIONAL	GA	LPV200	0	1	0	1	0	1
ACJ	JIMMY CARTER RGNL	GA	LPV	0	1	0	1	0	1
D73	MONROE-WALTON COUNTY	GA	LP	0	1	0	1	0	1
2J5	MILLEN	GA	LPV	0	1	0	1	0	1
MLJ	BALDWIN COUNTY	GA	LPV	0	1	0	1	0	1
09J	JEKYLL ISLAND	GA	LPV200	0	1	0	1	0	1
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	1	0	1	0	1
FFC	PEACHTREE CITY-FALCON FIELD	GA	LPV200	0	1	0	1	0	1
VPC	CARTERSVILLE	GA	LPV	0	1	0	1	0	1
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	1	0	1	0	1
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	1	0	1	0	1
MCN	MIDDLE GEORGIA REGIONAL	GA	LPV	0	1	0	1	0	1
MGR	MOULTRIE MUNI	GA	LPV	0	1	0	1	0	1
MQW	TELFAIR-WHEELER	GA	LPV	0	1	0	1	0	1
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	1	0	1	0	1
DQH	DOUGLAS MUNI	GA	LPV200	0	1	0	1	0	1
19A	JACKSON COUNTY	GA	LPV	0	1	0	1	0	1
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	0	1	0	1	0	1
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	1	0	1	0	1
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	1	0	1	0	1
EZM	HEART OF GEORGIA REGIONAL	GA	LPV	0	1	0	1	0	1
AJR	HABERSHAM COUNTY	GA	LPV	0	1	0	1	0	1
CSG	COLUMBUS METROPOLITAN	GA	LPV	0	1	0	1	0	1
TVI	THOMASVILLE REGIONAL	GA	LPV	0	1	0	1	0	1
SBO	EMANUEL COUNTY	GA	LPV	0	1	0	1	0	1
JZP	PICKENS COUNTY	GA	LPV	0	1	0	1	0	1
18A	FRANKLIN COUNTY	GA	LPV	0	1	0	1	0	1
CKF	CRISP COUNTY-CORDELE	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
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	1	0	1	0	1
9A1	COVINGTON MUNI	GA	LPV	0	1	0	1	0	1
HOE	HOMERVILLE	GA	LPV	0	1	0	1	0	1
VDI	VIDALIA RGNL	GA	LPV	0	1	0	1	0	1
JYL	PLANTATION ARPK	GA	LPV	0	1	0	1	0	1
LZU	GWINNETT COUNTY-BRISCOE FIELD	GA	LPV200	0	1	0	1	0	1
FTY	FULTON COUNTY ARPT-BROWN FIELD	GA	LPV	0	1	0	1	0	1
4J1	BRANTLEY COUNTY	GA	LPV	0	1	0	1	0	1
AHN	ATHENS/BEN EPPS	GA	LPV	0	1	0	1	0	1
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	1	0	1	0	1
JES	JESUP-WAYNE COUNTY	GA	LPV	0	1	0	1	0	1
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	1	0	1	0	1
17J	DONALSONVILLE MUNI	GA	LPV	0	1	0	1	0	1
OKZ	KAOLIN FIELD	GA	LPV	0	1	0	1	0	1
VLD	VALDOSTA RGNL	GA	LPV	0	1	0	1	0	1
15J	COOK COUNTY	GA	LPV	0	1	0	1	0	1
DVN	DAVENPORT MUNI	IA	LPV200	0	1	0	1	0	1
CSQ	CRESTON MUNI	IA	LPV	0	1	0	1	0	1
EFW	JEFFERSON MUNI	IA	LPV	0	1	0	1	0	1
LRJ	LE MARS MUNI	IA	LPV	0	1	0	1	0	1
OOA	OSKALOOSA MUNI	IA	LPV	0	1	0	1	0	1
TVK	CENTERVILLE MUNI	IA	LPV	0	1	0	1	0	1
GGI	GRINNELL REGIONAL	IA	LPV	0	1	0	1	0	1
TZT	BELLE PLAINE MUNI	IA	LPV	0	1	0	1	0	1
DBQ	DUBUQUE REGIONAL	IA	LPV200	0	1	0	1	0	1
DEH	DECORAH MUNI	IA	LPV	0	1	0	1	0	1
FXY	FOREST CITY MUNI	IA	LPV	0	1	0	1	0	1
AIO	ATLANTIC MUNI	IA	LPV	0	1	0	1	0	1
CWI	CLINTON MUNI	IA	LPV200	0	1	0	1	0	1
AWG	WASHINGTON MUNI	IA	LPV200	0	1	0	1	0	1
PEA	PELLA MUNI	IA	LPV	0	1	0	1	0	1
SLB	STORM LAKE MUNI	IA	LPV	0	1	0	1	0	1
IKV	ANKENY REGIONAL	IA	LPV	0	1	0	1	0	1
BRL	SOUTHEAST IOWA REGIONAL	IA	LPV200	0	1	0	1	0	1
ICL	SCHENCK FIELD	IA	LPV	0	1	0	1	0	1
I75	OSCEOLA MUNI	IA	LPV	0	1	0	1	0	1
IIB	INDEPENDENCE MUNI	IA	LP	0	1	0	1	0	1
PRO	PERRY MUNI	IA	LPV200	0	1	0	1	0	1
RDK	RED OAK MUNI	IA	LPV	0	1	0	1	0	1
SHL	SHELDON MUNI	IA	LPV	0	1	0	1	0	1
CID	THE EASTERN IOWA	IA	LPV200	0	1	0	1	0	1
DSM	DES MOINES INTL	IA	LPV	0	1	0	1	0	1
EST	ESTHERVILLE MUNI	IA	LPV	0	1	0	1	0	1
SPW	SPENCER MUNI	IA	LPV200	0	1	0	1	0	1
TNU	NEWTON MUNI	IA	LPV	0	1	0	1	0	1
SDA	SHENANDOAH MUNI	IA	LPV	0	1	0	1	0	1
SKI	SAC CITY MUNI	IA	LPV	0	1	0	1	0	1
MXO	MONTICELLO REGIONAL	IA	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
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	1	0	1	0	1
OTM	OTTUMWA REGIONAL	IA	LPV	0	1	0	1	0	1
MUT	MUSCATINE MUNI	IA	LPV	0	1	0	1	0	1
ALO	WATERLOO REGIONAL	IA	LPV	0	1	0	1	0	1
AMW	AMES MUNI	IA	LPV	0	1	0	1	0	1
EBS	WEBSTER CITY MUNI	IA	LPV	0	1	0	1	0	1
IOW	IOWA CITY MUNI	IA	LPV	0	1	0	1	0	1
MCW	MASON CITY MUNI	IA	LPV200	0	1	0	1	0	1
EOK	KEOKUK MUNI	IA	LPV	0	1	0	1	0	1
CBF	COUNCIL BLUFFS MUNI	IA	LPV200	0	1	0	1	0	1
FFL	FAIRFIELD MUNI	IA	LPV	0	1	0	1	0	1
OXV	KNOXVILLE MUNI	IA	LPV	0	1	0	1	0	1
POH	POCAHONTAS MUNI	IA	LPV	0	1	0	1	0	1
VTI	VINTON VETERANS MEML ARPK	IA	LPV	0	1	0	1	0	1
SUX	SIOUX GATEWAY/COL BUD DAY FIELD	IA	LPV200	0	1	0	1	0	1
FOD	FORT DODGE REGIONAL	IA	LPV200	0	1	0	1	0	1
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	1	0	1	0	1
DNS	DENISON MUNI	IA	LPV	0	1	0	1	0	1
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	1	0	1	0	1
MAN	NAMPA MUNI	ID	LPV	0	1	0	1	0	1
TWF	JOSLIN FIELD-MAGIC VALLEY RGNL	ID	LPV200	0	1	0	1	0	1
BOI	BOISE AIR TERMINAL/GOWEN FLD	ID	LPV	0	1	0	1	0	1
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	0	1	0	1	0	1
MYL	MC CALL MUNICIPAL	ID	LPV	0	1	0	1	0	1
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	1	0	1	0	1
IDA	IDAHO FALLS REGIONAL	ID	LPV200	0	1	0	1	0	1
JER	JEROME COUNTY	ID	LPV	0	1	0	1	0	1
COE	PAPPY BOYINGTON FIELD	ID	LPV200	0	1	0	1	0	1
U76	MOUNTAIN HOME MUNI	ID	LPV	0	1	0	1	0	1
PIH	POCATELLO REGIONAL	ID	LPV200	0	1	0	1	0	1
GNG	GOODING MUNI	ID	LPV	0	1	0	1	0	1
3LF	LITCHFIELD MUNI	IL	LPV	0	1	0	1	0	1
AJG	MOUNT CARMEL MUNI	IL	LPV	0	1	0	1	0	1
MTO	COLES COUNTY MEMORIAL	IL	LPV	0	1	0	1	0	1
IGQ	LANSING MUNI	IL	LPV	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 MUNI	IL	LPV	0	1	0	1	0	1
ALN	ST LOUIS REGIONAL	IL	LPV200	0	1	0	1	0	1
UIN	QUINCY RGNL-BALDWIN FIELD	IL	LPV200	0	1	0	1	0	1
RSV	ROBINSON MUNI	IL	LPV	0	1	0	1	0	1
DPA	DUPAGE	IL	LPV200	0	1	0	1	0	1
RPJ	ROCHELLE MUNI-KORITZ FIELD	IL	LPV200	0	1	0	1	0	1
ARR	AURORA MUNI	IL	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
DEC	DECATUR	IL	LPV200	0	1	0	1	0	1
PWK	CHICAGO EXECUTIVE	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
ORD	CHICAGO-O'HARE INTL	IL	LPV200	0	1	0	1	0	1
ENL	CENTRALIA MUNI	IL	LPV	0	1	0	1	0	1
FOA	FLORA MUNI	IL	LPV	0	1	0	1	0	1
MLI	QUAD CITY INTL	IL	LPV200	0	1	0	1	0	1
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	1	0	1	0	1
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	1	0	1	0	1
HSB	HARRISBURG-RALEIGH	IL	LPV	0	1	0	1	0	1
SFY	TRI-TOWNSHIP	IL	LP	0	1	0	1	0	1
LOT	LEWIS UNIVERSITY	IL	LPV200	0	1	0	1	0	1
PIA	GREATER PEORIA REGIONAL	IL	LPV	0	1	0	1	0	1
IKK	GREATER KANKAKEE	IL	LPV	0	1	0	1	0	1
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	0	1	0	1	0	1
I63	MOUNT STERLING MUNI	IL	LPV	0	1	0	1	0	1
PNT	PONTIAC MUNI	IL	LPV	0	1	0	1	0	1
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	1	0	1	0	1
C73	DIXON MUNI-CHARLES R. WALGREEN FLD	IL	LPV	0	1	0	1	0	1
DKB	DE KALB TAYLOR MUNI	IL	LPV	0	1	0	1	0	1
CUL	CARMI MUNI	IL	LP	0	1	0	1	0	1
UGN	WAUKEGAN REGIONAL	IL	LPV	0	1	0	1	0	1
SQI	WHITESIDE COUNTY-JOS J BITTORF FLD	IL	LPV	0	1	0	1	0	1
MVN	MOUNT VERNON	IL	LPV	0	1	0	1	0	1
MWA	WILLIAMSON COUNTY REGIONAL	IL	LPV	0	1	0	1	0	1
FEP	ALBERTUS	IL	LPV	0	1	0	1	0	1
DNV	VERMILION COUNTY	IL	LPV	0	1	0	1	0	1
AID	ANDERSON MUNI-DARLINGTON FIELD	IN	LPV	0	1	0	1	0	1
HNB	HUNTINGBURG	IN	LPV	0	1	0	1	0	1
LAF	PURDUE UNIVERSITY	IN	LPV	0	1	0	1	0	1
OXI	STARKE COUNTY	IN	LPV	0	1	0	1	0	1
RCR	FULTON COUNTY	IN	LPV	0	1	0	1	0	1
I22	RANDOLPH COUNTY	IN	LPV	0	1	0	1	0	1
IND	INDIANAPOLIS INTL	IN	LPV	0	1	0	1	0	1
MIE	DELAWARE COUNTY-JOHNSON FIELD	IN	LPV	0	1	0	1	0	1
GYY	GARY/CHICAGO INTERNATIONAL	IN	LPV200	0	1	0	1	0	1
TEL	PERRY COUNTY MUNI	IN	LP	0	1	0	1	0	1
BFR	VIRGIL I GRISSOM MUNI	IN	LP	0	1	0	1	0	1
VPZ	PORTER COUNTY MUNI	IN	LPV	0	1	0	1	0	1
SMD	SMITH FIELD	IN	LPV	0	1	0	1	0	1
OVO	NORTH VERNON	IN	LPV	0	1	0	1	0	1
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	1	0	1	0	1
IMS	MADISON MUNI	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
BAK	COLUMBUS MUNI	IN	LPV	0	1	0	1	0	1
MZZ	MARION MUNI	IN	LPV	0	1	0	1	0	1
FRH	FRENCH LICK MUNI	IN	LPV	0	1	0	1	0	1
BMG	MONROE COUNTY	IN	LPV200	0	1	0	1	0	1
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	1	0	1	0	1
4I7	PUTNAM COUNTY	IN	LPV	0	1	0	1	0	1
GSH	GOSHEN MUNI	IN	LPV	0	1	0	1	0	1
RZL	JASPER COUNTY	IN	LPV	0	1	0	1	0	1
PLD	PORTLAND MUNI	IN	LPV	0	1	0	1	0	1
JVY	CLARK RGNL	IN	LPV200	0	1	0	1	0	1
ASW	WARSAW MUNICIPAL	IN	LPV	0	1	0	1	0	1
SER	FREEMAN MUNI	IN	LPV	0	1	0	1	0	1
SBN	SOUTH BEND REGIONAL	IN	LPV	0	1	0	1	0	1
GEZ	SHELBYVILLE MUNI	IN	LPV	0	1	0	1	0	1
OKK	KOKOMO MUNI	IN	LPV200	0	1	0	1	0	1
RID	RICHMOND MUNI	IN	LPV200	0	1	0	1	0	1
EKM	ELKHART MUNI	IN	LPV	0	1	0	1	0	1
EVV	EVANSVILLE RGNL	IN	LPV200	0	1	0	1	0	1
FWA	FORT WAYNE INTERNATIONAL	IN	LPV200	0	1	0	1	0	1
HUF	TERRE HAUTE INTERNATIONAL-HULMAN FIELD	IN	LPV200	0	1	0	1	0	1
MCX	WHITE COUNTY	IN	LP	0	1	0	1	0	1
MQJ	MOUNT COMFORT	IN	LPV	0	1	0	1	0	1
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	0	1	0	1	0	1
GWB	DE KALB COUNTY	IN	LPV	0	1	0	1	0	1
HFY	GREENWOOD MUNI	IN	LPV	0	1	0	1	0	1
CEV	METTEL FIELD	IN	LPV	0	1	0	1	0	1
PTS	ATKINSON MUNI	KS	LPV	0	1	0	1	0	1
ULS	ULYSSES	KS	LPV	0	1	0	1	0	1
CBK	SHALZ FIELD	KS	LPV	0	1	0	1	0	1
EGT	WELLINGTON MUNI	KS	LPV	0	1	0	1	0	1
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	1	0	1	0	1
MYZ	MARYSVILLE MUNI	KS	LPV	0	1	0	1	0	1
PPF	TRI-CITY	KS	LPV	0	1	0	1	0	1
TQK	SCOTT CITY MUNI	KS	LPV	0	1	0	1	0	1
ANY	ANTHONY MUNI	KS	LP	0	1	0	1	0	1
LWC	LAWRENCE MUNI	KS	LPV200	0	1	0	1	0	1
FOE	FORBES FIELD	KS	LPV	0	1	0	1	0	1
HUT	HUTCHINSON MUNI	KS	LPV	0	1	0	1	0	1
EMP	EMPORIA MUNI	KS	LPV	0	1	0	1	0	1
UKL	COFFEY COUNTY	KS	LPV	0	1	0	1	0	1
MPR	MCPHERSON	KS	LPV	0	1	0	1	0	1
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV	0	1	0	1	0	1
RPB	BELLEVILLE MUNI	KS	LPV	0	1	0	1	0	1
PTT	PRATT INDUSTRIAL	KS	LPV	0	1	0	1	0	1
MHK	MANHATTAN REGIONAL	KS	LPV200	0	1	0	1	0	1
K88	ALLEN COUNTY	KS	LPV	0	1	0	1	0	1
TOP	PHILIP BILLARD MUNI	KS	LPV200	0	1	0	1	0	1
FSK	FORT SCOTT MUNI	KS	LPV	0	1	0	1	0	1
IDP	INDEPENDENCE MUNI	KS	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
IXD	NEW CENTURY AIRCENTER	KS	LPV	0	1	0	1	0	1
DDC	DODGE CITY REGIONAL	KS	LPV	0	1	0	1	0	1
LQR	LARNED PAWNEE CO	KS	LPV	0	1	0	1	0	1
HQG	HUGOTON MUNI	KS	LPV	0	1	0	1	0	1
ICT	WICHITA MID-CONTINENT	KS	LPV200	0	1	0	1	0	1
RSL	RUSSELL MUNI	KS	LPV	0	1	0	1	0	1
ADT	ATWOOD-RAWLINS COUNTY CITY-COUNTY	KS	LPV	0	1	0	1	0	1
GLD	RENNER FLD/GOODLAND MUNI/	KS	LPV200	0	1	0	1	0	1
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	0	1	0	1	0	1
GCK	GARDEN CITY REGIONAL	KS	LPV	0	1	0	1	0	1
3AU	AUGUSTA MUNI	KS	LP	0	1	0	1	0	1
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	1	0	1	0	1
AAO	COLONEL JAMES JABARA	KS	LPV	0	1	0	1	0	1
NRN	NORTON MUNI	KS	LPV	0	1	0	1	0	1
OEL	OAKLEY MUNI	KS	LPV	0	1	0	1	0	1
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	1	0	1	0	1
OWI	OTTAWA MUNI	KS	LP	0	1	0	1	0	1
GBD	GREAT BEND MUNI	KS	LPV200	0	1	0	1	0	1
CNK	BLOSSER MUNI	KS	LP	0	1	0	1	0	1
SLN	SALINA MUNI	KS	LPV	0	1	0	1	0	1
HYS	HAYS REGIONAL	KS	LPV200	0	1	0	1	0	1
OWB	OWENSBORO-DAVIESS COUNTY	KY	LPV200	0	1	0	1	0	1
27K	GEORGETOWN SCOTT CO-MARSHALL FLD	KY	LPV200	0	1	0	1	0	1
CVG	CINCINNATI/NORTHERN KENTUCKY INTL	KY	LPV200	0	1	0	1	0	1
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	0	1	0	1	0	1
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	0	1	0	1	0	1
M21	MUHLENBERG COUNTY	KY	LP	0	1	0	1	0	1
BWG	BOWLING GREEN-WARREN CTY RGNL	KY	LPV	0	1	0	1	0	1
TWT	STURGIS MUNI	KY	LPV	0	1	0	1	0	1
LEX	BLUE GRASS	KY	LPV	0	1	0	1	0	1
LOZ	LONDON-CORBIN ARPT-MAGEE FLD	KY	LPV	0	1	0	1	0	1
W38	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	0	1	0	1	0	1
SME	LAKE CUMBERLAND REGIONAL	KY	LPV	0	1	0	1	0	1
CEY	KYLE-OAKLEY FIELD	KY	LPV	0	1	0	1	0	1
DVK	STUART POWELL FIELD	KY	LPV	0	1	0	1	0	1
GLW	GLASGOW MUNI	KY	LPV	0	1	0	1	0	1
BRY	SAMUELS FIELD	KY	LPV	0	1	0	1	0	1
EHR	HENDERSON CITY-COUNTY	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
SDF	LOUISVILLE INTL-STANDIFORD FLD	KY	LPV200	0	1	0	1	0	1
PAH	BARKLEY REGIONAL	KY	LPV	0	1	0	1	0	1
AAS	TAYLOR COUNTY	KY	LP	0	1	0	1	0	1
LOU	BOWMAN FIELD	KY	LP	0	1	0	1	0	1
K22	BIG SANDY REGIONAL	KY	LPV	0	1	0	1	0	1
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	0	1	0	1	0	1
FGX	FLEMING-MASON	KY	LPV	0	1	0	1	0	1
7K4	OHIO COUNTY	KY	LPV	0	1	0	1	0	1
I39	MADISON	KY	LPV	0	1	0	1	0	1
6I2	LEBANON-SPRINGFIELD	KY	LP	0	1	0	1	0	1
K20	WENDELL H FORD	KY	LPV200	0	1	0	1	0	1
2I0	MADISONVILLE MUNI	KY	LPV	0	1	0	1	0	1
EKX	ADDINGTON FIELD	KY	LPV	0	1	0	1	0	1
DWU	ASHLAND REGIONAL	KY	LP	0	1	0	1	0	1
M97	MOREHEAD-ROWAN COUNTY CLYDE A THOMAS RGNL	KY	LPV	0	1	0	1	0	1
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	1	0	1	0	1
L39	LEESVILLE	LA	LPV	0	1	0	1	0	1
TVR	VICKSBURG TALLULAH REGIONAL	LA	LPV	0	1	0	1	0	1
LCH	LAKE CHARLES REGIONAL	LA	LPV	0	1	0	1	0	1
IER	NATCHITOCHES REGIONAL	LA	LPV	0	1	0	1	0	1
BTR	BATON ROUGE METRO	LA	LPV200	0	1	0	1	0	1
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	0	1	0	1	0	1
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	1	0	1	0	1
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	1	0	1	0	1
HZR	FALSE RIVER RGNL	LA	LPV	0	1	0	1	0	1
MSY	LOUIS ARMSTRONG NEW ORLEANS INTL	LA	LPV200	0	1	0	1	0	1
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	1	0	1	0	1
NEW	LAKEFRONT	LA	LPV	0	1	0	1	0	1
ARA	ACADIANA REGIONAL	LA	LPV	0	1	0	1	0	1
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	1	0	1	0	1
LFT	LAFAYETTE REGIONAL	LA	LPV	0	1	0	1	0	1
SPH	SPRINGHILL	LA	LPV	0	1	0	1	0	1
AEX	ALEXANDRIA INTL	LA	LPV200	0	1	0	1	0	1
CWF	CHENNAULT INTL	LA	LPV200	0	1	0	1	0	1
UXL	SOUTHLAND FIELD	LA	LPV	0	1	0	1	0	1
IYA	ABBEVILLE CHRIS CRUSTA MEML	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
BXA	GEORGE R CARR MEMORIAL AIR FIELD	LA	LPV	0	1	0	1	0	1
RSN	RUSTON RGNL AIRPORT	LA	LPV	0	1	0	1	0	1
SHV	SHREVEPORT REGIONAL	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
MLU	MONROE REGIONAL	LA	LPV200	0	1	0	1	0	1
F88	JONESBORO	LA	LP	0	1	0	1	0	1
ESF	ESLER REGIONAL	LA	LPV200	0	1	0	1	0	1
HUM	HOUMA-TERREBONNE	LA	LPV200	0	1	0	1	0	1
GAO	SOUTH LAFOURCHE LEONARD MILLER JR	LA	LPV	0	1	0	1	0	1
1L0	ST JOHN THE BAPTIST PARISH	LA	LPV	0	1	0	1	0	1
EWB	NEW BEDFORD REGIONAL	MA	LP	0	1	0	1	0	1
PYM	PLYMOUTH MUNI	MA	LPV200	0	1	0	1	0	1
GBR	WALTER J KOLADZA	MA	LP	0	1	0	1	0	1
BAF	BARNES MUNI	MA	LPV	0	1	0	1	0	1
ORE	ORANGE MUNI	MA	LPV	0	1	0	1	0	1
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	1	0	1	0	1
LWM	LAWRENCE MUNI	MA	LPV200	0	1	0	1	0	1
BVY	BEVERLY MUNI	MA	LPV	0	1	0	1	0	1
OWD	NORWOOD MEMORIAL	MA	LPV	0	1	0	1	0	1
ACK	NANTUCKET MEMORIAL	MA	LPV200	0	1	0	1	0	1
HYA	BARNSTABLE MUNI-BOARDMAN/POLANDO FIELD	MA	LPV200	0	1	0	1	0	1
MVY	MARTHAS VINEYARD	MA	LPV200	0	1	0	1	0	1
3B0	SOUTHBRIDGE MUNI	MA	LPV	0	1	0	1	0	1
ORH	WORCESTER REGIONAL	MA	LPV200	0	1	0	1	0	1
BOS	GEN EDWARD LAWRENCE LOGAN INTL	MA	LPV200	0	1	0	1	0	1
SBY	SALISBURY-OCEAN CITY WICOMICO REGIONAL	MD	LPV200	0	1	0	1	0	1
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	1	0	1	0	1
2G4	GARRETT COUNTY	MD	LPV	0	1	0	1	0	1
OXB	OCEAN CITY MUNI	MD	LPV	0	1	0	1	0	1
ESN	EASTON/NEWNAM FIELD	MD	LPV	0	1	0	1	0	1
CBE	GREATER CUMBERLAND REGIONAL	MD	LP	0	1	0	1	0	1
2W6	ST. MARY'S COUNTY RGNL	MD	LPV	0	1	0	1	0	1
FDK	FREDERICK MUNI	MD	LPV	0	1	0	1	0	1
MTN	MARTIN STATE	MD	LPV	0	1	0	1	0	1
HGR	HAGERSTOWN RGNL-RICHARD A HENSON FIELD	MD	LPV200	0	1	0	1	0	1
DMW	CARROLL COUNTY REGNL/JACK B POAGE FIELD	MD	LPV200	0	1	0	1	0	1
BWI	BALTIMORE-WASHINGTON INTL THURGOOD MARSHALL	MD	LPV200	0	1	0	1	0	1
RKD	KNOX COUNTY REGIONAL	ME	LPV	0	1	0	1	0	1
LEW	AUBURN/LEWISTON MUNI	ME	LPV200	0	1	0	1	0	1
PQI	NORTHERN MAINE REGIONAL ARPT AT PRESQUE IS	ME	LPV200	0	1	0	1	0	1
FVE	NORTHERN AROOSTOOK REGIONAL	ME	LPV	0	1	0	1	0	1
BXM	BRUNSWICK EXECUTIVE	ME	LPV	0	1	0	1	0	1
AUG	AUGUSTA STATE	ME	LPV200	0	1	0	1	0	1
BGR	BANGOR INTL	ME	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
SFM	SANFORD REGIONAL	ME	LPV200	0	1	0	1	0	1
1B0	DEXTER REGIONAL	ME	LP	0	1	0	1	0	1
HUL	HOULTON INTL	ME	LP	0	1	0	1	0	1
MLT	MILLINOCKET MUNI	ME	LPV	0	1	0	1	0	1
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	1	0	1	0	1
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	0	1	0	1	0	1
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	1	0	1	0	1
PHN	SAINT CLAIR COUNTY INTL	MI	LPV200	0	1	0	1	0	1
IMT	FORD	MI	LPV	0	1	0	1	0	1
AMN	GRATIOT COMMUNITY	MI	LPV	0	1	0	1	0	1
FFX	FREMONT MUNI	MI	LPV	0	1	0	1	0	1
SAW	SAWYER INTERNATIONAL	MI	LPV200	0	1	0	1	1	1
RNP	OWOSSO COMMUNITY	MI	LPV	0	1	0	1	0	1
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	1	0	1	0	1
77G	MARLETTE	MI	LPV	0	1	0	1	0	1
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	1	0	1	0	1
BIV	TULIP CITY	MI	LPV	0	1	0	1	0	1
ESC	DELTA COUNTY	MI	LPV200	0	1	0	1	0	1
IRS	KIRSCH MUNI	MI	LPV	0	1	0	1	0	1
MOP	MOUNT PLEASANT MUNI	MI	LPV	0	1	0	1	0	1
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	1	0	1	0	1
FNT	BISHOP INTERNATIONAL	MI	LPV200	0	1	0	1	0	1
HYX	SAGINAW COUNTY H.W. BROWNE	MI	LPV	0	1	0	1	0	1
AZO	KALAMAZOO/BATTLE CREEK INTERNATIONAL	MI	LPV	0	1	0	1	0	1
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	1	0	1	0	1
DTW	DETROIT METROPOLITAN WAYNE COUNTY	MI	LPV200	0	1	0	1	0	1
ANJ	SAULT STE MARIE MUNI - SANDERSON FIELD	MI	LPV	0	1	0	1	0	1
MBS	MBS INTL	MI	LPV200	0	1	0	1	0	1
MKG	MUSKEGON COUNTY	MI	LPV200	0	1	0	1	0	1
PLN	PELLSTON RGNL ARPT OF EMMET COUNTY	MI	LPV200	0	1	0	1	0	1
GDW	GLADWIN ZETTEL MEMORIAL	MI	LP	0	1	0	1	0	1
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	1	0	1	1	1
N98	BOYNE CITY MUNI	MI	LP	0	1	0	1	0	1
YIP	WILLOW RUN	MI	LPV	0	1	0	1	0	1
OSC	OSCODA-WURTSMITH	MI	LPV200	0	1	0	1	0	1
SLH	CHEBOYGAN COUNTY	MI	LPV	0	1	0	1	0	1
ACB	ANTRIM COUNTY	MI	LPV	0	1	0	1	0	1
BTL	W K KELLOGG	MI	LPV200	0	1	0	1	0	1
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	0	1	0	1	1	1
CVX	CHARLEVOIX MUNI	MI	LPV	0	1	0	1	0	1
TVC	CHERRY CAPITAL	MI	LPV	0	1	0	1	0	1
9D9	HASTINGS	MI	LP	0	1	0	1	0	1
LAN	CAPITAL CITY	MI	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
LDM	MASON COUNTY	MI	LPV	0	1	0	1	0	1
ADG	LENAWEE COUNTY	MI	LPV	0	1	0	1	0	1
CAD	WEXFORD COUNTY	MI	LPV200	0	1	0	1	0	1
DET	COLEMAN A YOUNG MUNI	MI	LPV	0	1	0	1	0	1
TTF	CUSTER	MI	LPV	0	1	0	1	0	1
MNM	MENOMINEE-MARINETTE TWIN COUNTY	MI	LPV200	0	1	0	1	0	1
LWA	SOUTH HAVEN AREA REGIONAL	MI	LP	0	1	0	1	0	1
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV	0	1	0	1	0	1
JXN	JACKSON COUNTY-REYNOLDS FIELD	MI	LPV200	0	1	0	1	0	1
OZW	LIVINGSTON COUNTY SPENCER J HARDY	MI	LPV200	0	1	0	1	0	1
OEB	BRANCH COUNTY MEMORIAL	MI	LPV	0	1	0	1	0	1
GRR	GERALD R. FORD INTL	MI	LPV200	0	1	0	1	0	1
IKW	JACK BARSTOW	MI	LPV	0	1	0	1	0	1
GLR	GAYLORD RGNL	MI	LPV	0	1	0	1	0	1
APN	ALPENA COUNTY REGIONAL	MI	LPV	0	1	0	1	0	1
ARB	ANN ARBOR MUNI	MI	LPV	0	1	0	1	0	1
ERY	LUCE COUNTY	MI	LPV	0	1	0	1	0	1
ELO	ELY MUNI	MN	LPV200	0	1	1	1	1	0.9999
PKD	PARK RAPIDS MUNI-KONSHOK FIELD	MN	LPV200	0	1	0	1	1	0.9999
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN	MN	LPV200	0	1	0	1	1	1
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	1	0	1	1	0.9999
BDE	BAUDETTE INTL	MN	LPV	0	1	1	1	1	0.9999
DTL	DETROIT LAKES-WETHING FIELD	MN	LPV	0	1	0	1	1	0.9999
FRM	FAIRMONT MUNI	MN	LPV	0	1	0	1	0	1
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	1	0	1	1	1
TVF	THIEF RIVER FALLS	MN	LPV	0	1	1	1	1	0.9999
STC	ST CLOUD REGIONAL	MN	LPV200	0	1	0	1	1	0.9999
DLH	DULUTH INTL	MN	LPV200	0	1	0	1	1	0.9999
HCD	HUTCHINSON MUNI-BUTLER FIELD	MN	LPV	0	1	0	1	1	1
MGG	MAPLE LAKE MUNI	MN	LP	0	1	0	1	1	1
ORB	ORR REGIONAL	MN	LP	0	1	1	1	1	0.9999
FSE	FOSSTON MUNI	MN	LP	0	1	1	1	1	0.9999
LVN	AIRLAKE	MN	LPV200	0	1	0	1	1	1
SAZ	STAPLES MUNI	MN	LPV	0	1	0	1	1	0.9999
CNB	MYERS FIELD	MN	LPV	0	1	0	1	1	1
INL	FALLS INTL	MN	LPV	0	1	1	1	1	0.9999
FOZ	BIGFORK MUNICIPAL	MN	LP	0	1	1	1	1	0.9999
LXL	LITTLE FALLS/MORRISON CO-LINDBERGH FLD	MN	LPV	0	1	0	1	1	0.9999
D39	SAUK CENTRE MUNI	MN	LP	0	1	0	1	1	0.9999
AEL	ALBERT LEA MUNI	MN	LPV	0	1	0	1	0	1
TWM	RICHARD B HELGESON	MN	LPV	0	1	0	1	1	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	1	0	1	1	1
ROS	RUSH CITY REGIONAL	MN	LPV	0	1	0	1	1	0.9999
MKT	MANKATO REGIONAL	MN	LPV200	0	1	0	1	1	1
RGK	RED WING RGNL	MN	LPV200	0	1	0	1	1	1
AUM	AUSTIN MUNI	MN	LPV200	0	1	0	1	0	1
CBG	CAMBRIDGE MUNI	MN	LPV	0	1	0	1	1	0.9999
CQM	COOK MUNI	MN	LP	0	1	1	1	1	0.9999
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	1	0	1	1	0.9999
FFM	FERGUS FALLS MUNI-EINAR MICKELSON FLD	MN	LPV200	0	1	0	1	1	0.9999
ROX	ROSEAU MUNI/RUDY BILLBERG FIELD	MN	LPV	0	1	1	1	1	0.9999
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	1	0	1	1	1
OWA	OWATONNA DEGNER RNGL	MN	LPV200	0	1	0	1	1	1
ANE	ANOKA COUNTY-BLAINE ARPT (JANES FIELD)	MN	LPV	0	1	0	1	1	1
RRT	WARROAD INTL MEMORIAL	MN	LPV	0	1	1	1	1	0.9999
BBB	BENSON MUNI	MN	LPV	0	1	0	1	1	1
GPZ	GRAND RAPIDS/ITASCA CO-GORDON NEWSTROM	MN	LPV	0	1	0	1	1	0.9999
VVV	ORTONVILLE MUNI-MARTINSON FIELD	MN	LP	0	1	0	1	1	0.9999
FCM	FLYING CLOUD	MN	LPV200	0	1	0	1	1	1
HIB	CHISHOLM-HIBBING	MN	LPV200	0	1	1	1	1	0.9999
RST	ROCHESTER INTERNATIONAL	MN	LPV200	0	1	0	1	0	1
AXN	CHANDLER FIELD	MN	LPV	0	1	0	1	1	0.9999
BDH	WILLMAR MUNI-JOHN L RICE FIELD	MN	LPV	0	1	0	1	1	1
RWF	REDWOOD FALLS MUNI	MN	LPV	0	1	0	1	1	1
BJI	BEMIDJI REGIONAL	MN	LPV200	0	1	1	1	1	0.9999
CKN	CROOKSTON MUNI/KIRKWOOD FLD	MN	LPV	0	1	1	1	1	0.9999
MML	SOUTHWEST MINNESOTA RGNL MARSHALL/RYAN FIELD	MN	LPV200	0	1	0	1	1	1
RCM	SKYHAVEN	MO	LPV	0	1	0	1	0	1
UUV	SULLIVAN REGIONAL	MO	LPV	0	1	0	1	0	1
K02	PERRYVILLE MUNI	MO	LPV	0	1	0	1	0	1
LXT	LEE'S SUMMIT MUNI	MO	LPV	0	1	0	1	0	1
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	1	0	1	0	1
DMO	SEDALIA MEMORIAL	MO	LPV	0	1	0	1	0	1
K57	GOULD PETERSON MUNI	MO	LPV	0	1	0	1	0	1
FAM	FARMINGTON REGIONAL	MO	LPV	0	1	0	1	0	1
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	1	0	1	0	1
HIG	HIGGINSVILLE INDUSTRIAL MUNI	MO	LPV	0	1	0	1	0	1
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	0	1	0	1	0	1
UNO	WEST PLAINS MUNI	MO	LPV	0	1	0	1	0	1
FTT	ELTON HENSLEY MEMORIAL	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
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
CGI	CAPE GIRARDEAU RGNL	MO	LPV	0	1	0	1	0	1
EIW	COUNTY MEMORIAL	MO	LPV	0	1	0	1	0	1
M05	CARUTHERSVILLE MEM	MO	LPV	0	1	0	1	0	1
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV	0	1	0	1	0	1
UBX	CUBA MUNI	MO	LPV	0	1	0	1	0	1
NVD	NEVADA MUNICIPAL	MO	LPV200	0	1	0	1	0	1
MYJ	MEXICO MEMORIAL	MO	LPV	0	1	0	1	0	1
1H0	CREVE COEUR	MO	LPV	0	1	0	1	0	1
M17	BOLIVAR MUNI	MO	LPV	0	1	0	1	0	1
PLK	M. GRAHAM CLARK-TANEY COUNTY	MO	LPV200	0	1	0	1	0	1
MO8	NORTH CENTRAL MISSOURI REGIONAL	MO	LPV	0	1	0	1	0	1
TBN	WAYNESVILLE-ST ROBERT RGNL/FORNEY AAF	MO	LPV	0	1	0	1	0	1
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	1	0	1	0	1
FWB	BRANSON WEST MUNI-EMERSON FIELD	MO	LP	0	1	0	1	0	1
COU	COLUMBIA REGIONAL	MO	LPV	0	1	0	1	0	1
CHT	CHILLICOTHE MUNI	MO	LPV	0	1	0	1	0	1
HAE	HANNIBAL RGNL	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
VER	JESSE VIERTEL MEMORIAL	MO	LPV	0	1	0	1	0	1
DXE	DEXTER MUNI	MO	LPV	0	1	0	1	0	1
MHL	MARSHALL MEML MUNI	MO	LPV	0	1	0	1	0	1
MCI	KANSAS CITY INTL	MO	LPV	0	1	0	1	0	1
JLN	JOPLIN REGIONAL	MO	LPV	0	1	0	1	0	1
BBG	BRANSON	MO	LPV200	0	1	0	1	0	1
HFJ	MONETT MUNI	MO	LPV	0	1	0	1	0	1
6M6	LEWIS COUNTY REGIONAL	MO	LPV	0	1	0	1	0	1
MAW	MALDEN MUNI	MO	LPV	0	1	0	1	0	1
VIH	ROLLA NATIONAL	MO	LPV200	0	1	0	1	0	1
SIK	SIKESTON MEML MUNI	MO	LPV	0	1	0	1	0	1
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	1	0	1	0	1
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	1	0	1	0	1
MKC	CHARLES B. WHEELER DOWNTOWN	MO	LPV200	0	1	0	1	0	1
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	1	0	1	0	1
FYG	WASHINGTON RGNL	MO	LPV	0	1	0	1	0	1
H21	CAMDENTON MEMORIAL	MO	LPV	0	1	0	1	0	1
POF	POPLAR BLUFF MUNI	MO	LPV	0	1	0	1	0	1
EZZ	CAMERON MEMORIAL	MO	LPV	0	1	0	1	0	1
MBY	OMAR N BRADLEY	MO	LPV	0	1	0	1	0	1
STL	LAMBERT-ST LOUIS INTL	MO	LPV200	0	1	0	1	0	1
GPT	GULFPORT-BILOXI INTL	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
PQL	TRENT LOTT INTL	MS	LPV200	0	1	0	1	0	1
STF	GEORGE M BRYAN	MS	LPV200	0	1	0	1	0	1
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	1	0	1	0	1
GLH	MID DELTA REGIONAL	MS	LPV200	0	1	0	1	0	1
HSA	STENNIS INTL	MS	LPV200	0	1	0	1	0	1
UTA	TUNICA MUNI	MS	LPV200	0	1	0	1	0	1
MPE	PHILADELPHIA MUNI	MS	LPV	0	1	0	1	0	1
JAN	JACKSON-EVERS INTL	MS	LPV200	0	1	0	1	0	1
LUL	HESLER-NOBLE FIELD	MS	LPV	0	1	0	1	0	1
RNV	CLEVELAND MUNI	MS	LPV	0	1	0	1	0	1
UOX	UNIVERSITY-OXFORD	MS	LPV	0	1	0	1	0	1
MEI	KEY FIELD	MS	LPV200	0	1	0	1	0	1
IDL	INDIANOLA MUNI	MS	LPV	0	1	0	1	0	1
OLV	OLIVE BRANCH	MS	LPV	0	1	0	1	0	1
CKM	FLETCHER FIELD	MS	LPV	0	1	0	1	0	1
HEZ	HARDY-ANDERS FLD NATCHEZ-ADAMS COUNTY	MS	LPV	0	1	0	1	0	1
HBG	HATTIESBURG BOBBY L. CHAIN MUNI	MS	LPV200	0	1	0	1	0	1
MJD	PICAYUNE MUNI	MS	LPV	0	1	0	1	0	1
PIB	HATTIESBURG-LAUREL REGIONAL	MS	LPV200	0	1	0	1	0	1
HKS	HAWKINS FIELD	MS	LPV200	0	1	0	1	0	1
M40	MONROE COUNTY	MS	LPV	0	1	0	1	0	1
CRX	ROSCOE TURNER	MS	LPV200	0	1	0	1	0	1
GNF	GRENADA MUNI	MS	LPV	0	1	0	1	0	1
GWO	GREENWOOD-LEFLORE	MS	LPV	0	1	0	1	0	1
GTR	GOLDEN TRIANGLE RGNL	MS	LPV	0	1	0	1	0	1
M43	PRENTISS-JEFFERSON DAVIS COUNTY	MS	LPV	0	1	0	1	0	1
TUP	TUPELO REGIONAL	MS	LPV200	0	1	0	1	0	1
MCB	MC COMB-PIKE COUNTY-JOHN E LEWIS FIELD	MS	LPV	0	1	0	1	0	1
SBX	SHELBY	MT	LP	0	1	0	1	1	1
GDV	DAWSON COMMUNITY	MT	LPV	0	1	0	1	1	0.9999
GPI	GLACIER PARK INTL	MT	LPV	0	1	0	1	0	1
GTF	GREAT FALLS INTL	MT	LPV200	0	1	0	1	1	1
7S0	RONAN	MT	LPV	0	1	0	1	0	1
6S8	LAUREL MUNICIPAL	MT	LPV	0	1	0	1	0	1
WYS	YELLOWSTONE	MT	LPV200	0	1	0	1	0	1
BZN	GALLATIN FIELD	MT	LPV	0	1	0	1	0	1
MSO	MISSOULA INTERNATIONAL	MT	LPV	0	1	0	1	0	1
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	1	0	1	0	1
LVM	MISSION FIELD	MT	LP	0	1	0	1	0	1
LWT	LEWISTOWN MUNI	MT	LPV	0	1	0	1	1	0.9999
HLN	HELENA REGIONAL	MT	LPV	0	1	0	1	0	1
HVR	HAVRE CITY-COUNTY	MT	LPV	0	1	0	1	1	0.9999
M75	MALTA	MT	LP	0	1	0	1	1	0.9999
1S3	TILLITT FIELD	MT	LPV	0	1	0	1	1	0.9999
MLS	FRANK WILEY FIELD	MT	LPV	0	1	0	1	1	0.9999
GGW	WOKAL FIELD/GLASGOW INTL	MT	LPV200	0	1	0	1	1	0.9999

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BTM	BERT MOONEY	MT	LPV	0	1	0	1	0	1
SDY	SIDNEY-RICHLAND MUNI	MT	LPV	0	1	0	1	1	0.9999
CYQM	Moncton Intl	NB	LPV	0	1	0	1	0	1
CYCL	Charlo	NB	LPV	0	1	0	1	0	1
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	1	0	1	0	1
OAJ	ALBERT J ELLIS	NC	LPV200	0	1	0	1	0	1
SOP	MOORE COUNTY	NC	LPV	0	1	0	1	0	1
AKH	GASTONIA MUNI	NC	LPV	0	1	0	1	0	1
AVL	ASHEVILLE REGIONAL	NC	LPV	0	1	0	1	0	1
BUY	BURLINGTON-ALAMANCE REGIONAL	NC	LPV200	0	1	0	1	0	1
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	1	0	1	0	1
TDF	PERSON COUNTY	NC	LPV200	0	1	0	1	0	1
HKY	HICKORY REGIONAL	NC	LPV200	0	1	0	1	0	1
HNZ	HENDERSON-OXFORD	NC	LPV	0	1	0	1	0	1
FAY	FAYETTEVILLE REGIONAL/GRANNIS FIELD	NC	LPV200	0	1	0	1	0	1
LBT	LUMBERTON MUNI	NC	LPV	0	1	0	1	0	1
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	1	0	1	0	1
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	0	1	0	1	0	1
IPJ	LINCOLNTON-LINCOLN COUNTY REGIONAL	NC	LPV	0	1	0	1	0	1
ISO	KINSTON REGL JETPORT AT STALLINGS FLD	NC	LPV	0	1	0	1	0	1
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	0	1	0	1	0	1
SVH	STATESVILLE REGIONAL	NC	LPV	0	1	0	1	0	1
MQI	DARE COUNTY REGIONAL	NC	LPV	0	1	0	1	0	1
MRN	FOOTHILLS REGIONAL	NC	LPV200	0	1	0	1	0	1
IXA	HALIFAX-NORTHAMPTON REGIONAL	NC	LPV200	0	1	0	1	0	1
AFP	ANSON COUNTY-JEFF CLOUD FLD	NC	LPV	0	1	0	1	0	1
ECG	ELIZABETH CITY CG AIR STATION/REGIONAL	NC	LPV	0	1	0	1	0	1
EQY	MONROE REGIONAL	NC	LPV	0	1	0	1	0	1
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	0	1	0	1	0	1
TTA	SANFORD-LEE COUNTY REGIONAL	NC	LPV200	0	1	0	1	0	1
MEB	LAURINBURG-MAXTON	NC	LPV200	0	1	0	1	0	1
PGV	PITT-GREENVILLE	NC	LPV	0	1	0	1	0	1
JQF	CONCORD RGNL	NC	LPV	0	1	0	1	0	1
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	1	0	1	0	1
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	0	1	0	1	0	1
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	1	0	1	0	1
GWW	GOLDSBORO-WAYNE MUNI	NC	LPV200	0	1	0	1	0	1
VUJ	STANLY COUNTY	NC	LPV200	0	1	0	1	0	1
SUT	CAPE FEAR RGNL JETPORT/HOWIE FRANKLIN FLD	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
LHZ	FRANKLIN COUNTY	NC	LPV200	0	1	0	1	0	1
PMZ	PLYMOUTH MUNI	NC	LP	0	1	0	1	0	1
RWI	ROCKY MOUNT-WILSON REGIONAL	NC	LPV	0	1	0	1	0	1
FQD	RUTHERFORD CO/MARCHMAN FIELD	NC	LPV	0	1	0	1	0	1
HRJ	HARNETT COUNTY	NC	LPV	0	1	0	1	0	1
JNX	JOHNSTON COUNTY	NC	LPV200	0	1	0	1	0	1
MRH	MICHAEL J. SMITH FIELD	NC	LPV	0	1	0	1	0	1
DPL	DUPLIN COUNTY	NC	LPV200	0	1	0	1	0	1
EDE	NORTHEASTERN RGNL	NC	LPV200	0	1	0	1	0	1
RCZ	RICHMOND COUNTY	NC	LPV	0	1	0	1	0	1
OCW	WARREN FIELD	NC	LPV	0	1	0	1	0	1
RUQ	ROWAN COUNTY	NC	LPV200	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
GAF	HUTSON FIELD	ND	LPV	0	1	1	1	1	0.9999
HZE	MERCER COUNTY REGIONAL	ND	LPV	0	1	0	1	1	0.9999
FAR	HECTOR INTL	ND	LPV200	0	1	0	1	1	0.9999
GFK	GRAND FORKS INTL	ND	LPV	0	1	1	1	1	0.9999
JMS	JAMESTOWN REGIONAL	ND	LPV200	0	1	0	1	1	0.9999
D55	ROBERTSON FIELD	ND	LPV	0	1	1	1	1	0.9999
RUG	RUGBY MUNI	ND	LP	0	1	1	1	1	0.9999
MOT	MINOT INTL	ND	LPV	0	1	1	1	1	0.9999
D09	BOTTINEAU MUNI	ND	LPV	0	1	1	1	1	0.9998
GWR	GWINNER-ROGER MELROE FIELD	ND	LPV200	0	1	0	1	1	0.9999
BIS	BISMARCK MUNI	ND	LPV200	0	1	0	1	1	0.9999
DVL	DEVILS LAKE RGNL	ND	LPV	0	1	1	1	1	0.9999
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	1	0	1	1	0.9999
S25	WATFORD CITY MUNI	ND	LPV	0	1	0	1	1	0.9999
BAC	BARNES COUNTY MUNI	ND	LPV	0	1	0	1	1	0.9999
DIK	DICKINSON-THEODORE ROOSEVELT REGIONAL	ND	LPV200	0	1	0	1	1	0.9999
ISN	SLOULIN FLD INTL	ND	LPV200	0	1	1	1	1	0.9999
BVN	ALBION MUNI	NE	LPV	0	1	0	1	0	1
07K	CENTRAL CITY MUNI-LARRY REINEKE FIELD	NE	LPV	0	1	0	1	0	1
MLE	MILLARD	NE	LPV	0	1	0	1	0	1
AFK	NEBRASKA CITY MUNI	NE	LPV	0	1	0	1	0	1
RBE	ROCK COUNTY	NE	LPV	0	1	0	1	0	1
LNK	LINCOLN	NE	LPV	0	1	0	1	0	1
12K	SUPERIOR MUNI	NE	LPV	0	1	0	1	0	1
CDR	CHADRON MUNI	NE	LPV200	0	1	0	1	0	1
AIA	ALLIANCE MUNI	NE	LPV200	0	1	0	1	0	1
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	1	0	1	0	1
EAR	KEARNEY RGNL	NE	LPV	0	1	0	1	0	1
ANW	AINSWORTH MUNI	NE	LPV200	0	1	0	1	0	1
CZD	COZAD MUNI	NE	LPV	0	1	0	1	0	1
MCK	MCCOOK REGIONAL	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
TIF	THOMAS COUNTY	NE	LPV	0	1	0	1	0	1
93Y	DAVID CITY MUNI	NE	LPV	0	1	0	1	0	1
0B4	HARTINGTON MUNI	NE	LPV	0	1	0	1	0	1
GRN	GORDON MUNI	NE	LPV	0	1	0	1	0	1
ODX	EVELYN SHARP FIELD	NE	LPV	0	1	0	1	0	1
OKS	GARDEN COUNTY	NE	LPV	0	1	0	1	0	1
CEK	CRETE MUNICIPAL	NE	LPV	0	1	0	1	0	1
FBY	FAIRBURY MUNI	NE	LPV	0	1	0	1	0	1
ONL	THE O'NEILL MUNI-JOHN L BAKER FIELD	NE	LPV	0	1	0	1	0	1
JYR	YORK MUNICIPAL	NE	LPV	0	1	0	1	0	1
8V2	STUART-ATKINSON MUNI	NE	LPV	0	1	0	1	0	1
BBW	BROKEN BOW MUNI	NE	LPV	0	1	0	1	0	1
AUH	AURORA MUNICIPAL - AL POTTER FIELD	NE	LPV	0	1	0	1	0	1
OMA	EPPLEY AIRFIELD	NE	LPV	0	1	0	1	0	1
GRI	CENTRAL NEBRASKA REGIONAL	NE	LPV	0	1	0	1	0	1
HSI	HASTINGS MUNI	NE	LPV	0	1	0	1	0	1
FNB	BRENNER FIELD	NE	LPV	0	1	0	1	0	1
PMV	PLATTSMOUTH MUNI	NE	LPV	0	1	0	1	0	1
BIE	BEATRICE MUNI	NE	LPV200	0	1	0	1	0	1
6K3	CREIGHTON MUNI	NE	LPV	0	1	0	1	0	1
GGF	GRANT MUNI	NE	LPV	0	1	0	1	0	1
AHQ	WAHOO MUNI	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
IBM	KIMBALL MUNI/ROBERT E ARRAJ FI	NE	LPV	0	1	0	1	0	1
LCG	WAYNE MUNI	NE	LPV	0	1	0	1	0	1
4V9	ANTELOPE COUNTY	NE	LPV	0	1	0	1	0	1
BFF	WESTERN NEB. RGNL/WILLIAM B. HEILIG FIELD	NE	LPV	0	1	0	1	0	1
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	1	0	1	0	1
IML	IMPERIAL MUNI	NE	LPV	0	1	0	1	0	1
LXN	JIM KELLY FIELD	NE	LPV	0	1	0	1	0	1
OLU	COLUMBUS MUNI	NE	LPV	0	1	0	1	0	1
LBF	NORTH PLATTE RGNL AIRPORT LEE BIRD FIELD	NE	LPV	0	1	0	1	0	1
SWT	SEWARD MUNICIPAL	NE	LPV	0	1	0	1	0	1
9V5	MODISETT	NE	LPV	0	1	0	1	0	1
FET	FREMONT MUNI	NE	LPV	0	1	0	1	0	1
VTN	MILLER FIELD	NE	LPV	0	1	0	1	0	1
SNY	SIDNEY MUNI/LLOYD W. CARR FIELD	NE	LPV	0	1	0	1	0	1
HDE	BREWSTER FIELD	NE	LPV	0	1	0	1	0	1
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	1	0	1	0	1
HIE	MOUNT WASHINGTON REGIONAL	NH	LPV	0	1	0	1	0	1
EEN	DILLANT-HOPKINS	NH	LPV	0	1	0	1	0	1
LCI	LACONIA MUNI	NH	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
MHT	MANCHESTER	NH	LPV200	0	1	0	1	0	1
DAW	SKYHAVEN	NH	LPV	0	1	0	1	0	1
CON	CONCORD MUNI	NH	LPV	0	1	0	1	0	1
LEB	LEBANON MUNI	NH	LPV	0	1	0	1	0	1
47N	CENTRAL JERSEY REGIONAL	NJ	LP	0	1	0	1	0	1
ACY	ATLANTIC CITY INTERNATIONAL	NJ	LPV200	0	1	0	1	0	1
EWR	NEWARK LIBERTY INTL	NJ	LPV	0	1	0	1	0	1
39N	PRINCETON	NJ	LPV	0	1	0	1	0	1
MMU	MORRISTOWN MUNI	NJ	LPV200	0	1	0	1	0	1
CDW	ESSEX COUNTY	NJ	LPV	0	1	0	1	0	1
N40	SKY MANOR	NJ	LP	0	1	0	1	0	1
4N1	GREENWOOD LAKE	NJ	LP	0	1	0	1	0	1
VAY	SOUTH JERSEY REGIONAL	NJ	LP	0	1	0	1	0	1
MIV	MILLVILLE MUNI	NJ	LPV200	0	1	0	1	0	1
TEB	TETERBORO	NJ	LPV	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	96	0.9958
CVN	CLOVIS MUNI	NM	LPV	0	1	0	1	0	1
ROW	ROSWELL INTERNATIONAL AIR CENTER	NM	LPV	0	1	0	1	0	1
SRR	SIERRA BLANCA REGIONAL	NM	LPV200	0	1	0	1	0	1
LAM	LOS ALAMOS	NM	LP	0	1	0	1	0	1
HOB	LEA COUNTY REGIONAL	NM	LPV200	0	1	0	1	0	1
FMN	FOUR CORNERS RGNL	NM	LPV200	0	1	0	1	0	1
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV	0	1	0	1	1	1
ONM	SOCORRO MUNI	NM	LP	0	1	0	1	1	1
SVC	GRANT COUNTY	NM	LPV	0	1	0	1	1	1
CNM	CAVERN CITY AIR TRML	NM	LP	0	1	0	1	0	1
DMN	DEMING MUNI	NM	LPV	0	1	0	1	1	1
CYHZ	Halifax / Stanfield Intl	NS	LPV	0	1	0	1	1	1
CYEV	Inuvik	NT	LPV	3	0.9978	3	0.9976	6	0.9964
WMC	WINNEMUCCA MUNI	NV	LPV	0	1	0	1	0	1
RTS	RENO/STEAD	NV	LPV	0	1	0	1	43	0.9991
LAS	MC CARRAN INTL	NV	LPV	0	1	0	1	0	1
ELY	ELY ARPT-YELLAND FLD	NV	LPV	0	1	0	1	0	1
TPH	TONOPAH	NV	LP	0	1	0	1	1	1
RNO	RENO/TAHOE INTL	NV	LPV	0	1	0	1	52	0.9985
FRG	REPUBLIC	NY	LPV200	0	1	0	1	0	1
GFL	FLOYD BENNETT MEMORIAL	NY	LPV	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
ELM	ELMIRA/CORNING REGIONAL	NY	LPV200	0	1	0	1	0	1
LGA	LA GUARDIA	NY	LPV200	0	1	0	1	0	1
HTO	EAST HAMPTON	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
5B2	SARATOGA COUNTY	NY	LPV	0	1	0	1	0	1
NY0	FULTON COUNTY	NY	LPV	0	1	0	1	0	1
7G0	LEDGEDALE AIRPARK	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
N66	ONEONTA MUNI	NY	LPV	0	1	0	1	0	1
ROC	GREATER ROCHESTER INTL	NY	LPV200	0	1	0	1	0	1
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	1	0	1	0	1
ELZ	WELLSVILLE MUNI ARPT	NY	LPV	0	1	0	1	0	1
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	1	0	1	0	1
HWV	BROOKHAVEN	NY	LPV	0	1	0	1	0	1
4B6	TICONDEROGA MUNI	NY	LPV	0	1	0	1	0	1
BUF	BUFFALO NIAGARA INTL	NY	LPV	0	1	0	1	0	1
RME	GRIFFISS INTL	NY	LPV200	0	1	0	1	0	1
GVQ	BATAVIA	NY	LPV200	0	1	0	1	0	1
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	1	0	1	0	1
VGC	HAMILTON MUNI	NY	LPV	0	1	0	1	0	1
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	0	1	0	1	0	1
POU	DUTCHESS COUNTY	NY	LPV	0	1	0	1	0	1
HTF	HORNELL MUNI	NY	LPV	0	1	0	1	0	1
OGS	OGDENSBURG INTL	NY	LPV	0	1	0	1	0	1
ALB	ALBANY INTL	NY	LPV200	0	1	0	1	0	1
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	1	0	1	0	1
FOK	FRANCIS S. GABRESKI	NY	LPV200	0	1	0	1	0	1
PBG	PLATTSBURGH INTL	NY	LPV	0	1	0	1	0	1
44N	SKY ACRES	NY	LPV	0	1	0	1	0	1
D38	CANANDAIGUA	NY	LP	0	1	0	1	0	1
SWF	STEWART INTERNATIONAL	NY	LPV200	0	1	0	1	0	1
SCH	SCHENECTADY COUNTY	NY	LPV200	0	1	0	1	0	1
1B1	COLUMBIA COUNTY	NY	LPV	0	1	0	1	0	1
ART	WATERTOWN INTL	NY	LPV200	0	1	0	1	0	1
FZY	OSWEGO COUNTY	NY	LPV	0	1	0	1	0	1
SDC	WILLIAMSON-SODUS	NY	LPV	0	1	0	1	0	1
PEO	PENN YAN	NY	LPV	0	1	0	1	0	1
HPN	WESTCHESTER COUNTY	NY	LPV	0	1	0	1	0	1
9G0	BUFFALO AIRFIELD	NY	LP	0	1	0	1	0	1
BGM	GREATER BINGHAMTON/EDWIN A LINK FIELD	NY	LPV200	0	1	0	1	0	1
S24	SANDUSKY COUNTY REGIONAL	OH	LPV	0	1	0	1	0	1
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	1	0	1	0	1
UYF	MADISON COUNTY	OH	LPV	0	1	0	1	0	1
MFD	MANSFIELD LAHM REGIONAL	OH	LPV200	0	1	0	1	0	1
RZT	ROSS COUNTY	OH	LPV	0	1	0	1	0	1
DLZ	DELAWARE MUNI	OH	LPV	0	1	0	1	0	1
4I3	KNOX COUNTY	OH	LPV200	0	1	0	1	0	1
TOL	TOLEDO EXPRESS	OH	LPV200	0	1	0	1	0	1
TZR	BOLTON FIELD	OH	LPV200	0	1	0	1	0	1
LCK	RICKENBACKER INTL	OH	LPV200	0	1	0	1	0	1
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	1	0	1	0	1
MNN	MARION MUNI	OH	LPV	0	1	0	1	0	1
OWX	PUTNAM COUNTY	OH	LPV	0	1	0	1	0	1
0G6	WILLIAMS 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
MRT	UNION COUNTY	OH	LP	0	1	0	1	0	1
CMH	PORT COLUMBUS INTL	OH	LPV200	0	1	0	1	0	1
HAO	BUTLER CO RGNL	OH	LPV	0	1	0	1	0	1
UNI	OHIO UNIVERSITY SNYDER FIELD	OH	LPV200	0	1	0	1	0	1
I69	CLERMONT COUNTY	OH	LP	0	1	0	1	0	1
1G3	KENT STATE UNIV	OH	LPV	0	1	0	1	0	1
1G0	WOOD COUNTY	OH	LPV	0	1	0	1	0	1
BKL	BROOKHAVEN	OH	LPV	0	1	0	1	0	1
SGH	SPRINGFIELD-BECKLEY MUNI	OH	LPV200	0	1	0	1	0	1
FDY	FINDLAY	OH	LPV	0	1	0	1	0	1
USE	FULTON COUNTY	OH	LPV	0	1	0	1	0	1
16G	SENECA COUNTY	OH	LPV	0	1	0	1	0	1
CQA	LAKEFIELD	OH	LPV	0	1	0	1	0	1
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	1	0	1	0	1
HZY	ASHTABULA COUNTY	OH	LPV	0	1	0	1	0	1
I19	GREENE COUNTY-LEWIS A JACKSON REGIONAL	OH	LPV	0	1	0	1	0	1
I66	CLINTON FIELD	OH	LPV	0	1	0	1	0	1
ILN	AIRBORNE AIRPARK	OH	LPV200	0	1	0	1	0	1
OXD	MIAMI UNIVERSITY	OH	LPV	0	1	0	1	0	1
CAK	AKRON-CANTON RGNL	OH	LPV200	0	1	0	1	0	1
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	1	0	1	0	1
PMH	GREATER PORTSMOUTH REGIONAL	OH	LPV	0	1	0	1	0	1
PHD	HARRY CLEVER FIELD	OH	LP	0	1	0	1	0	1
LHQ	FAIRFIELD COUNTY	OH	LPV	0	1	0	1	0	1
PCW	CARL R KELLER FIELD	OH	LPV	0	1	0	1	0	1
GQQ	GALION MUNI	OH	LP	0	1	0	1	0	1
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	1	0	1	0	1
AXV	NEIL ARMSTRONG	OH	LPV	0	1	0	1	0	1
CXY	CAPITAL CITY	OH	LPV	0	1	0	1	0	1
AOH	LIMA ALLEN COUNTY	OH	LPV	0	1	0	1	0	1
LUK	CINCINNATI MUNI AIRPORT-LUNKEN FIELD	OH	LPV	0	1	0	1	0	1
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	1	0	1	0	1
I74	GRIMES FIELD	OH	LPV	0	1	0	1	0	1
EDJ	BELLEFONTAINE REGIONAL	OH	LPV	0	1	0	1	0	1
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	1	0	1	0	1
BJJ	WAYNE COUNTY	OH	LPV	0	1	0	1	0	1
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	0	1	0	1	0	1
TDZ	TOLEDO EXECUTIVE	OH	LP	0	1	0	1	0	1
LNN	WILLOUGHBY	OH	LPV	0	1	0	1	0	1
GUY	GUYMON MUNI	OK	LPV	0	1	0	1	0	1
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	1	0	1	0	1
GMJ	GROVE MUNI	OK	LPV	0	1	0	1	0	1
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	1	0	1	0	1
OWP	WILLIAM R. POGUE MUNI	OK	LPV	0	1	0	1	0	1
DUC	HALLIBURTON FIELD	OK	LPV	0	1	0	1	0	1
RCE	CLARENCE E. PAGE MUNI	OK	LPV	0	1	0	1	0	1
PWA	WILEY POST	OK	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
SWO	STILLWATER REGIONAL	OK	LPV	0	1	0	1	0	1
DUA	EAKER FIELD	OK	LPV	0	1	0	1	0	1
OKM	OKMULGEE REGIONAL	OK	LPV	0	1	0	1	0	1
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	1	0	1	0	1
ADM	ARDMORE MUNI	OK	LPV200	0	1	0	1	0	1
OKC	WILL ROGERS WORLD	OK	LPV200	0	1	0	1	0	1
PVJ	PAULS VALLEY MUNI	OK	LPV200	0	1	0	1	0	1
BKN	BLACKWELL-TONKAWA MUNI	OK	LPV	0	1	0	1	0	1
GZL	STIGLER REGIONAL	OK	LPV	0	1	0	1	0	1
RVS	RICHARD LLOYD JONES JR	OK	LPV	0	1	0	1	0	1
MKO	DAVIS FIELD	OK	LPV	0	1	0	1	0	1
GCM	CLAREMORE RGNL	OK	LPV	0	1	0	1	0	1
SNL	SHAWNEE REGIONAL	OK	LPV200	0	1	0	1	0	1
FDR	FREDERICK REGIONAL	OK	LPV200	0	1	0	1	0	1
WDG	ENID WOODRING REGIONAL	OK	LPV200	0	1	0	1	0	1
CLK	CLINTON REGIONAL	OK	LPV200	0	1	0	1	0	1
TUL	TULSA INTL	OK	LPV200	0	1	0	1	0	1
HSD	SUNDANCE AIRPARK	OK	LPV	0	1	0	1	0	1
CSM	CLINTON-SHERMAN	OK	LPV200	0	1	0	1	0	1
MLC	MC ALESTER REGIONAL	OK	LPV	0	1	0	1	0	1
TQH	TAHLEQUAH MUNI	OK	LPV	0	1	0	1	0	1
ADH	ADA MUNI	OK	LPV	0	1	0	1	0	1
WWR	WEST WOODWARD	OK	LPV	0	1	0	1	0	1
OUN	UNIVERSITY OF OKLAHOMA WESTHEIMER	OK	LPV200	0	1	0	1	0	1
AXS	ALTUS/QUARTZ MOUNTAIN REGIONAL	OK	LPV	0	1	0	1	0	1
HBR	HOBART MUNI	OK	LPV	0	1	0	1	0	1
F22	PERRY MUNI	OK	LPV	0	1	0	1	0	1
PNC	PONCA CITY REGIONAL	OK	LPV	0	1	0	1	0	1
BVO	BARTLESVILLE MUNI	OK	LPV	0	1	0	1	0	1
CYXL	Sioux Lookout	ON	LPV	0	1	1	0.9999	2	0.9998
CYOW	Ottawa / MacdonaldCartier Intl	ON	LPV	0	1	0	1	0	1
CNS7	Kincardine	ON	LPV	0	1	0	1	0	1
CYKF	Kitchener / Waterloo	ON	LPV	0	1	0	1	0	1
CYQT	Thunder Bay	ON	LPV	0	1	0	1	1	0.9999
CYTS	Timmins / Victor M Power	ON	LPV	0	1	0	1	0	1
CYHD	Dryden Regional	ON	LPV	0	1	1	0.9999	1	0.9998
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	1	0	1	5	0.9997
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	1	0	1	2	0.9998
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	1	0	1	0	1
ONO	ONTARIO MUNI	OR	LPV	0	1	0	1	0	1
LMT	KLAMATH FALLS	OR	LPV	0	1	0	1	41	0.9989
SLE	MCNARY FLD	OR	LPV200	0	1	0	1	22	0.9995
MMV	MCMINNVILLE MUNI	OR	LPV	0	1	0	1	20	0.9995
CVO	CORVALLIS MUNI	OR	LPV200	0	1	0	1	57	0.9986
UAO	AURORA STATE	OR	LPV	0	1	0	1	8	0.9997
EUG	MAHLON SWEET FIELD	OR	LPV200	0	1	0	1	60	0.9984

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	0	1	0	1	1	0.9999
S33	MADRAS MUNICIPAL	OR	LPV	0	1	0	1	2	0.9998
AST	ASTORIA REGIONAL	OR	LPV	0	1	0	1	11	0.9997
BDN	BEND MUNI	OR	LPV	0	1	0	1	2	0.9998
RDM	ROBERTS FIELD	OR	LPV200	0	1	0	1	2	0.9998
PDX	PORTLAND INTL	OR	LPV200	0	1	0	1	2	0.9998
PDT	EASTERN OREGON RGNL AT PENDLETON	OR	LPV200	0	1	0	1	1	1
LNS	LANCASTER	PA	LPV	0	1	0	1	0	1
HZL	HAZLETON MUNI	PA	LPV	0	1	0	1	0	1
MDT	HARRISBURG INTL	PA	LPV	0	1	0	1	0	1
PSB	MID STATE	PA	LPV	0	1	0	1	0	1
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	1	0	1	0	1
THV	YORK	PA	LP	0	1	0	1	0	1
OYM	ST MARYS MUNI	PA	LPV	0	1	0	1	0	1
LBE	ARNOLD PALMER RGNL	PA	LPV	0	1	0	1	0	1
N79	NORTHUMBERLAND COUNTY	PA	LPV	0	1	0	1	0	1
PNE	NORTHEAST PHILADELPHIA	PA	LPV	0	1	0	1	0	1
IPT	WILLIAMSPORT RGNL	PA	LPV	0	1	0	1	0	1
ABE	LEHIGH VALLEY INTL	PA	LPV	0	1	0	1	0	1
AFJ	WASHINGTON COUNTY	PA	LPV	0	1	0	1	0	1
BTP	BUTLER COUNTY/K W SCHOLTER FLD	PA	LPV	0	1	0	1	0	1
HMZ	BEDFORD COUNTY	PA	LPV	0	1	0	1	0	1
PIT	PITTSBURGH INTERNATIONAL	PA	LPV200	0	1	0	1	0	1
UKT	QUAKERTOWN	PA	LP	0	1	0	1	0	1
AGC	ALLEGHENY COUNTY	PA	LPV	0	1	0	1	0	1
AXQ	CLARION COUNTY	PA	LPV	0	1	0	1	0	1
BFD	BRADFORD REGIONAL	PA	LPV200	0	1	0	1	0	1
UCP	NEW CASTLE MUNI	PA	LPV	0	1	0	1	0	1
PHL	PHILADELPHIA INTL	PA	LPV	0	1	0	1	0	1
RVL	MIFFLIN COUNTY	PA	LPV	0	1	0	1	0	1
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA COUNTY	PA	LPV200	0	1	0	1	0	1
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	0	1	0	1	0	1
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	0	1	0	1	0	1
8G2	CORRY-LAWRENCE	PA	LPV	0	1	0	1	0	1
WAY	GREENE COUNTY	PA	LPV	0	1	0	1	0	1
FKL	VENANGO REGIONAL	PA	LPV	0	1	0	1	0	1
FWQ	ROSTRAVER	PA	LPV	0	1	0	1	0	1
AVP	WILKES-BARRE/SCRANTON INTL	PA	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
BVI	BEAVER FALLS MUNI	PA	LPV	0	1	0	1	0	1
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	1	0	1	0	1
UNV	UNIVERSITY PARK	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
XLL	ALLENTOWN-QUEEN CITY MUNI	PA	LP	0	1	0	1	0	1
MPO	POCONO MOUNTAINS MUNI	PA	LPV	0	1	0	1	0	1
GKJ	PORT MEADVILLE	PA	LP	0	1	0	1	0	1
8N8	DANVILLE	PA	LP	0	1	0	1	0	1
DUJ	DUBOIS RGNL	PA	LPV200	0	1	0	1	0	1
ERI	ERIE INTL/TOM RIDGE FLD	PA	LPV	0	1	0	1	0	1
9D4	DECK	PA	LPV	0	1	0	1	0	1
LOM	WINGS FIELD	PA	LPV	0	1	0	1	0	1
CYEY	Amos	QC	LPV	0	1	0	1	0	1
CTP9	Kattiniq / Donaldson	QC	LPV	2	0.9995	6	0.999	43	0.9937
CSR3	Victoriaville	QC	LPV	0	1	0	1	0	1
CYMX	Montreal (Mirabel Intl)	QC	LPV	0	1	0	1	0	1
CYRQ	TroisRivieres	QC	LPV	0	1	0	1	0	1
CYVB	Bonaventure	QC	LPV	0	1	0	1	0	1
CYVP	Kuujjuaq	QC	LPV	1	0.9998	3	0.9994	14	0.996
CYQB	Quebec / Jean Lesage Intl	QC	LPV	0	1	0	1	0	1
CYIF	StAugustin	QC	LPV	0	1	0	1	14	0.9996
CYHU	Montreal / StHubert	QC	LPV	0	1	0	1	0	1
CYYY	MontJoli	QC	LPV	0	1	0	1	0	1
CYRI	RiviereduLoup	QC	LPV	0	1	0	1	0	1
CPN8	Opinaca	QC	LPV	0	1	0	1	1	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
SMS	SUMTER	SC	LPV200	0	1	0	1	0	1
RBW	LOWCOUNTRY REGIONAL	SC	LPV200	0	1	0	1	0	1
CRE	GRAND STRAND	SC	LPV200	0	1	0	1	0	1
CDN	WOODWARD FIELD	SC	LPV	0	1	0	1	0	1
ARW	BEAUFORT CO	SC	LPV200	0	1	0	1	0	1
BBP	MARLBORO COUNTY JETPORT-H E AVENT FIELD	SC	LPV	0	1	0	1	0	1
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	0	1	0	1	0	1
BNL	BARNWELL RGNL	SC	LPV	0	1	0	1	0	1
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	1	0	1	0	1
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	0	1	0	1	0	1
AND	ANDERSON RGNL	SC	LPV200	0	1	0	1	0	1
FLO	FLORENCE REGIONAL	SC	LPV	0	1	0	1	0	1
DCM	CHESTER CATAWBA REGIONAL	SC	LPV	0	1	0	1	0	1
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	1	0	1	0	1
CEU	OCONEE COUNTY RGNL	SC	LPV	0	1	0	1	0	1
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	1	0	1	0	1
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SC	LPV200	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
CAE	COLUMBIA METROPOLITAN	SC	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
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	1	0	1	0	1
LQK	PICKENS COUNTY	SC	LPV	0	1	0	1	0	1
OGB	ORANGEBURG MUNI	SC	LPV200	0	1	0	1	0	1
GYH	DONALDSON CENTER	SC	LPV	0	1	0	1	0	1
AIK	AIKEN MUNI	SC	LPV200	0	1	0	1	0	1
UDG	DARLINGTON COUNTY JETPORT	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
LKR	LANCASTER COUNTY-MC WHIRTER FIELD	SC	LPV200	0	1	0	1	0	1
DYB	SUMMERVILLE	SC	LPV200	0	1	0	1	0	1
ABR	ABERDEEN REGIONAL	SD	LPV200	0	1	0	1	1	0.9999
HSR	HOT SPRINGS MUNI	SD	LP	0	1	0	1	0	1
FSD	JOE FOSS FIELD	SD	LPV200	0	1	0	1	1	1
PIR	PIERRE REGIONAL	SD	LPV	0	1	0	1	0	1
MDS	MADISON MUNI	SD	LPV	0	1	0	1	1	1
BKX	BROOKINGS REGIONAL	SD	LPV	0	1	0	1	1	0.9999
RAP	RAPID CITY REGIONAL	SD	LPV200	0	1	0	1	0	1
HON	HURON REGIONAL	SD	LPV200	0	1	0	1	1	0.9999
MBG	MOBRIDGE MUNI	SD	LPV	0	1	0	1	1	0.9999
MKA	MILLER MUNI	SD	LPV200	0	1	0	1	1	0.9999
0D8	GETTYSBURG MUNI	SD	LPV200	0	1	0	1	1	0.9999
SPF	BLACK HILLS-CLYDE ICE FIELD	SD	LPV	0	1	0	1	0	1
ATY	WATERTOWN REGIONAL	SD	LPV200	0	1	0	1	1	1
VMR	HAROLD DAVIDSON FLD	SD	LPV	0	1	0	1	0	1
YKN	CHAN GURNEY MUNI	SD	LPV200	0	1	0	1	0	1
MHE	MITCHELL MUNI	SD	LPV	0	1	0	1	0	1
49B	STURGIS MUNI	SD	LPV	0	1	0	1	0	1
ICR	WINNER RGNL	SD	LPV	0	1	0	1	0	1
CKQ8	McArthur River	SK	LPV	1	0.9997	2	0.9995	7	0.9981
CYKJ	Key Lake	SK	LPV	1	0.9998	2	0.9995	4	0.9984
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	1	0	1	0	1
MOR	MOORE-MURRELL	TN	LPV	0	1	0	1	0	1
NQA	MILLINGTON REGIONAL JETPORT	TN	LPV	0	1	0	1	0	1
PHT	HENRY COUNTY	TN	LPV200	0	1	0	1	0	1
FYE	FAYETTE CO	TN	LPV	0	1	0	1	0	1
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	1	0	1	0	1
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	0	1	0	1	0	1
M33	SUMNER COUNTY REGIONAL	TN	LP	0	1	0	1	0	1
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	1	0	1	0	1
SYI	BOMAR FIELD-SHELBYVILLE MUNI	TN	LPV	0	1	0	1	0	1
MRC	MAURY COUNTY	TN	LPV	0	1	0	1	0	1
UCY	EVERETT-STEWART	TN	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
BNA	NASHVILLE INTL	TN	LPV200	0	1	0	1	0	1
CKV	OUTLAW FIELD	TN	LPV	0	1	0	1	0	1
MQY	SMYRNA	TN	LPV	0	1	0	1	0	1
CSV	CROSSVILLE MEMORIAL-WHITSON FIELD	TN	LPV200	0	1	0	1	0	1
BGF	WINCHESTER MUNI	TN	LPV	0	1	0	1	0	1
DKX	KNOXVILLE DOWNTOWN ISLAND	TN	LPV	0	1	0	1	0	1
SZY	ROBERT SIBLEY	TN	LPV	0	1	0	1	0	1
M01	GENERAL DEWITT SPAIN	TN	LPV	0	1	0	1	0	1
MBT	MURFREESBORO MUNI	TN	LPV	0	1	0	1	0	1
GZS	ABERNATHY FIELD	TN	LPV	0	1	0	1	0	1
TYS	MCGHEE-TYSON	TN	LPV	0	1	0	1	0	1
MEM	MEMPHIS INTL	TN	LPV200	0	1	0	1	0	1
RKW	ROCKWOOD MUNI	TN	LPV	0	1	0	1	0	1
FYM	FAYETTEVILLE MUNI	TN	LPV	0	1	0	1	0	1
HZD	CARROLL COUNTY	TN	LPV	0	1	0	1	0	1
0A3	SMITHVILLE MUNI	TN	LP	0	1	0	1	0	1
1A3	MARTIN CAMPBELL FIELD	TN	LP	0	1	0	1	0	1
SRB	UPPER CUMBERLAND REGIONAL	TN	LPV200	0	1	0	1	0	1
LUG	ELLINGTON	TN	LPV	0	1	0	1	0	1
PVE	BEECH RIVER REGIONAL	TN	LPV	0	1	0	1	0	1
0M3	JOHN A BAKER	TN	LP	0	1	0	1	0	1
CHA	LOVELL FIELD	TN	LPV200	0	1	0	1	0	1
DYR	DYERSBURG REGIONAL	TN	LPV	0	1	0	1	0	1
MMI	MCMINN COUNTY	TN	LPV	0	1	0	1	0	1
JWN	JOHN C. TUNE	TN	LPV	0	1	0	1	0	1
0M4	BENTON COUNTY	TN	LPV	0	1	0	1	0	1
1M5	PORTLAND MUNI	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
M54	LEBANON MUNI	TN	LPV	0	1	0	1	0	1
0M5	HUMPHREYS COUNTY	TN	LP	0	1	0	1	0	1
3M7	LAFAYETTE MUNI	TN	LPV	0	1	0	1	0	1
THA	TULLAHOMA REGIONAL/WM NORTHERN FLD	TN	LPV	0	1	0	1	0	1
MKL	MC KELLAR-SIPES REGIONAL	TN	LPV200	0	1	0	1	0	1
FWS	FORT WORTH SPINKS	TX	LPV200	0	1	0	1	0	1
SGR	SUGAR LAND RGNL	TX	LPV200	0	1	0	1	0	1
ERV	KERRVILLE MUNI/LOUIS SCHREINER FLD	TX	LPV	0	1	0	1	0	1
RKP	ARANSAS COUNTY	TX	LPV	0	1	0	1	0	1
GDJ	GRANBURY RGNL	TX	LPV	0	1	0	1	0	1
LLN	LEVELLAND MUNI	TX	LPV	0	1	0	1	0	1
MFE	MC ALLEN MILLER INTL	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
SWW	AVENGER FIELD	TX	LPV	0	1	0	1	0	1
SAT	SAN ANTONIO INTL	TX	LPV200	0	1	0	1	0	1
GGG	EAST TEXAS REGIONAL	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
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	1	0	1	0	1
DFW	DALLAS-FT WORTH INTL	TX	LPV200	0	1	0	1	0	1
LBX	BRAZORIA COUNTY	TX	LPV	0	1	0	1	0	1
MDD	MIDLAND AIRPARK	TX	LPV	0	1	0	1	0	1
JWY	MID-WAY RGNL	TX	LPV200	0	1	0	1	0	1
GLS	SCHOLES INTL AT GALVESTON	TX	LPV	0	1	0	1	0	1
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	1	0	1	0	1
BBD	CURTIS FIELD	TX	LPV	0	1	0	1	0	1
LUD	DECATUR MUNI	TX	LPV	0	1	0	1	0	1
PRX	COX FIELD	TX	LPV	0	1	0	1	0	1
TYR	TYLER POUNDS RGNL	TX	LPV	0	1	0	1	0	1
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	1	0	1	0	1
PVW	HALE COUNTY	TX	LPV	0	1	0	1	0	1
GRK	ROBERT GRAY AAF	TX	LPV200	0	1	0	1	0	1
5C1	BOERNE STAGE FIELD	TX	LP	0	1	0	1	0	1
ELP	EL PASO INTL	TX	LP	0	1	0	1	0	1
BRO	BROWNSVILLE/SOUTH PADRE ISLAND INTL	TX	LP	0	1	0	1	0	1
DTO	DENTON MUNI	TX	LPV	0	1	0	1	0	1
TKI	COLLIN COUNTY REGIONAL AT MC KINNEY	TX	LPV200	0	1	0	1	0	1
F00	JONES FIELD	TX	LPV	0	1	0	1	0	1
LVJ	PEARLAND RGNL	TX	LPV	0	1	0	1	0	1
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	1	0	1	0	1
CNW	TSTC WACO	TX	LPV200	0	1	0	1	0	1
11R	BRENHAM MUNI	TX	LPV	0	1	0	1	0	1
BAZ	NEW BRAUNFELS MUNI	TX	LPV	0	1	0	1	0	1
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV	0	1	0	1	0	1
DRT	DEL RIO INTL	TX	LPV	0	1	0	1	0	1
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	1	0	1	0	1
GVT	MAJORS	TX	LPV	0	1	0	1	0	1
HDO	HONDO MUNI	TX	LPV	0	1	0	1	0	1
TRL	TERRELL MUNI	TX	LPV	0	1	0	1	0	1
SLR	SULPHUR SPRINGS MUNI	TX	LPV200	0	1	0	1	0	1
LFK	ANGELINA COUNTY	TX	LPV	0	1	0	1	0	1
MAF	MIDLAND INTERNATIONAL	TX	LPV	0	1	0	1	0	1
TFP	T P MC CAMPBELL	TX	LPV	0	1	0	1	0	1
UTS	HUNTSVILLE MUNI	TX	LPV	0	1	0	1	0	1
TPL	DRAUGHON-MILLER CENTRAL TEXAS REGIONAL	TX	LPV200	0	1	0	1	0	1
ASL	HARRISON COUNTY	TX	LPV	0	1	0	1	0	1
OCH	A L MANGHAM JR REGIONAL	TX	LPV200	0	1	0	1	0	1
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	1	0	1	0	1
DAL	DALLAS LOVE FIELD	TX	LPV200	0	1	0	1	0	1
CLL	EASTERWOOD FIELD	TX	LPV200	0	1	0	1	0	1
EBG	EDINBURG INTL	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
FST	FT. STOCKTON-PECOS COUNTY	TX	LPV	0	1	0	1	0	1
2R9	KARNES COUNTY	TX	LP	0	1	0	1	0	1
2F5	LAMESA MUNI	TX	LP	0	1	0	1	0	1
77F	WINTERS MUNI	TX	LP	0	1	0	1	0	1
GLE	GAINESVILLE MUNI	TX	LPV	0	1	0	1	0	1
GNC	GAINES COUNTY	TX	LPV	0	1	0	1	0	1
IKG	KLEBERG COUNTY	TX	LPV	0	1	0	1	0	1
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	1	0	1	0	1
TME	HOUSTON EXECUTIVE	TX	LPV	0	1	0	1	0	1
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	1	0	1	0	1
E19	GRUVER MUNI	TX	LP	0	1	0	1	0	1
E38	ALPINE-CASPARIS MUNICIPAL	TX	LP	0	1	0	1	0	1
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	1	0	1	0	1
ETN	EASTLAND MUNI	TX	LP	0	1	0	1	0	1
LHB	HEARNE MUNI	TX	LPV200	0	1	0	1	0	1
T59	WHEELER MUNI	TX	LP	0	1	0	1	0	1
HBV	JIM HOGG COUNTY	TX	LPV	0	1	0	1	0	1
INJ	HILLSBORO MUNI	TX	LPV	0	1	0	1	0	1
SJT	SAN ANGELO REGIONAL/MATHIS FLD	TX	LPV	0	1	0	1	0	1
GKY	ARLINGTON MUNI	TX	LPV200	0	1	0	1	0	1
HOU	WILLIAM P HOBBY	TX	LPV200	0	1	0	1	0	1
E01	ROY HURD MEMORIAL	TX	LP	0	1	0	1	0	1
IAH	GEORGE BUSH INTERCONTINENTAL/HOUSTON	TX	LPV200	0	1	0	1	0	1
ABI	ABILENE REGIONAL	TX	LPV200	0	1	0	1	0	1
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	1	0	1	0	1
BPT	SOUTHEAST TEXAS REGIONAL	TX	LPV200	0	1	0	1	0	1
6R3	CLEVELAND MUNI	TX	LPV	0	1	0	1	0	1
BWD	BROWNWOOD RGNL	TX	LPV	0	1	0	1	0	1
HQZ	MESQUITE METRO	TX	LPV	0	1	0	1	0	1
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	1	0	1	0	1
ARM	WHARTON RGNL	TX	LPV	0	1	0	1	0	1
F05	WILBARGER COUNTY	TX	LPV	0	1	0	1	0	1
EFD	ELLINGTON FIELD	TX	LPV200	0	1	0	1	0	1
VCT	VICTORIA	TX	LPV200	0	1	0	1	0	1
CXO	LONE STAR EXECUTIVE	TX	LPV200	0	1	0	1	0	1
DUX	MOORE COUNTY	TX	LPV200	0	1	0	1	0	1
8F3	CROSBYTON MUNICIPAL	TX	LP	0	1	0	1	0	1
LNC	LANCASTER	TX	LPV200	0	1	0	1	0	1
50R	LOCKHART MUNI	TX	LPV	0	1	0	1	0	1
CFD	COULTER FIELD	TX	LPV	0	1	0	1	0	1
XBP	BRIDGEPORT MUNI	TX	LPV	0	1	0	1	0	1
FTW	FORT WORTH/MEACHAM	TX	LPV200	0	1	0	1	0	1
HRX	HEREFORD MUNI	TX	LPV200	0	1	0	1	0	1
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	0	1	0	1	0	1
LXY	MEXIA-LIMESTONE CO	TX	LP	0	1	0	1	0	1
ACT	WACO RGNL	TX	LPV200	0	1	0	1	0	1
AFW	FORT WORTH ALLIANCE	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
DKR	HOUSTON COUNTY	TX	LP	0	1	0	1	0	1
ALI	ALICE INTERNATIONAL	TX	LPV	0	1	0	1	0	1
LRD	LAREDO INTL	TX	LPV200	0	1	0	1	0	1
ADS	ADDISON	TX	LPV	0	1	0	1	0	1
E11	ANDREWS COUNTY	TX	LPV	0	1	0	1	0	1
E30	BRUCE FIELD	TX	LPV	0	1	0	1	0	1
ORG	ORANGE COUNTY	TX	LPV	0	1	0	1	0	1
BYY	BAY CITY MUNI	TX	LPV	0	1	0	1	0	1
ENV	WENDOVER	UT	LPV	0	1	0	1	0	1
PVU	PROVO MUNI	UT	LPV200	0	1	0	1	0	1
BDG	BLANDING MUNI	UT	LPV	0	1	0	1	0	1
U55	PANGUITCH MUNI	UT	LPV200	0	1	0	1	0	1
FOM	FILLMORE MUNI	UT	LPV	0	1	0	1	0	1
VEL	VERNAL	UT	LP	0	1	0	1	0	1
BMC	BRIGHAM CITY	UT	LP	0	1	0	1	0	1
OGD	OGDEN-HINCKLEY	UT	LPV	0	1	0	1	0	1
PUC	CARBON COUNTY REGIONAL/BUCK DAVIS FIELD	UT	LP	0	1	0	1	0	1
U14	NEPHI MUNI	UT	LPV	0	1	0	1	0	1
SLC	SALT LAKE CITY INTL	UT	LP	0	1	0	1	0	1
SGU	ST GEORGE MUNI	UT	LPV	0	1	0	1	0	1
BCE	BRYCE CANYON	UT	LPV	0	1	0	1	0	1
DTA	DELTA MUNI	UT	LP	0	1	0	1	0	1
LGU	LOGAN-CACHE	UT	LPV	0	1	0	1	0	1
RIC	RICHMOND INTL	VA	LPV200	0	1	0	1	0	1
FVX	FARMVILLE REGIONAL	VA	LPV	0	1	0	1	0	1
PTB	DINWIDDIE COUNTY	VA	LPV	0	1	0	1	0	1
LNP	LONESOME PINE	VA	LPV	0	1	0	1	0	1
FKN	FRANKLIN MUN-JOHN BEVERLY ROSE	VA	LPV	0	1	0	1	0	1
HLX	TWIN COUNTY	VA	LPV	0	1	0	1	0	1
W63	MARKS MUNI	VA	LP	0	1	0	1	0	1
CPK	CHESAPEAKE REGIONAL	VA	LPV200	0	1	0	1	0	1
FCI	CHESTERFIELD COUNTY	VA	LPV	0	1	0	1	0	1
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	1	0	1	0	1
HSP	INGALLS FIELD	VA	LPV	0	1	0	1	0	1
ORF	NORFOLK INTL	VA	LPV200	0	1	0	1	0	1
SFQ	SUFFOLK EXECUTIVE	VA	LP	0	1	0	1	0	1
LYH	LYNCHBURG RGNL/PRESTON GLENN FLD	VA	LPV	0	1	0	1	0	1
MFV	ACCOMACK COUNTY	VA	LPV	0	1	0	1	0	1
PSK	NEW RIVER VALLEY	VA	LPV200	0	1	0	1	0	1
AVC	MECKLENBURG-BRUNSWICK REGIONAL	VA	LPV	0	1	0	1	0	1
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV	0	1	0	1	0	1
HEF	MANASSAS RGNL/HARRY P DAVIS FL	VA	LPV	0	1	0	1	0	1
JYO	LEESBURG EXECUTIVE	VA	LPV	0	1	0	1	0	1
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	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
OFP	HANOVER COUNTY MUNI	VA	LPV	0	1	0	1	0	1
EMV	EMPORIA-GREENSVILLE REGIONAL	VA	LPV200	0	1	0	1	0	1
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	1	0	1	0	1
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	1	0	1	0	1
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	1	0	1	0	1
W78	WILLIAM M TUCK	VA	LPV	0	1	0	1	0	1
MTV	BLUE RIDGE	VA	LPV	0	1	0	1	0	1
JFZ	TAZEWELL COUNTY	VA	LPV	0	1	0	1	0	1
LUA	LURAY CAVERNS	VA	LP	0	1	0	1	0	1
0VG	LEE COUNTY	VA	LPV	0	1	0	1	0	1
BCB	VIRGINIA TECH/MONTGOMERY EXECUTIVE	VA	LPV	0	1	0	1	0	1
ROA	ROANOKE REGIONAL/WOODRUM FIELD	VA	LPV	0	1	0	1	0	1
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	1	0	1	0	1
CJR	CULPEPER RGNL	VA	LPV	0	1	0	1	0	1
DAN	DANVILLE REGIONAL	VA	LPV200	0	1	0	1	0	1
OKV	WINCHESTER REGIONAL	VA	LPV200	0	1	0	1	0	1
RMN	STAFFORD REGIONAL	VA	LPV	0	1	0	1	0	1
LKU	LOUISA COUNTY/FREEMAN FIELD	VA	LPV	0	1	0	1	0	1
SHD	SHENANDOAH VALLEY REGIONAL	VA	LPV200	0	1	0	1	0	1
MPV	EDWARD F KNAPP STATE	VT	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
OLM	OLYMPIA RGNL	WA	LPV	0	1	0	1	2	0.9998
TDO	ED CARLSON MEMORIAL - SOUTH LEWIS CO	WA	LPV	0	1	0	1	2	0.9998
PSC	TRI-CITIES	WA	LPV200	0	1	0	1	1	1
TIW	TACOMA NARROWS	WA	LPV	0	1	0	1	2	0.9998
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV	0	1	0	1	2	0.9999
BLI	BELLINGHAM INTL	WA	LPV	0	1	0	1	2	0.9999
BVS	SKAGIT REGIONAL	WA	LPV	0	1	0	1	3	0.9999
YKM	YAKIMA AIR TERMINAL/MCALLISTER FIELD	WA	LPV200	0	1	0	1	1	0.9999
RLD	RICHLAND	WA	LPV	0	1	0	1	1	1
RNT	RENTON MUNI	WA	LPV	0	1	0	1	2	0.9999
GEG	SPOKANE INTL	WA	LPV200	0	1	0	1	0	1
HQM	BOWERMAN	WA	LPV200	0	1	0	1	5	0.9998
ALW	WALLA WALLA REGIONAL	WA	LPV	0	1	0	1	0	1
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	1	0	1	4	0.9998
AWO	ARLINGTON MUNI	WA	LPV200	0	1	0	1	3	0.9999
PUW	PULLMAN/MOSCOW REGIONAL	WA	LPV	0	1	0	1	0	1
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	1	0	1	2	0.9999
OTH	SOUTHWEST OREGON RGNL	WA	LPV	0	1	1	1	138	0.9913
DEW	DEER PARK	WA	LPV	0	1	0	1	0	1
MWH	GRANT COUNTY INTL	WA	LPV200	0	1	0	1	1	1

Airport Id	Airport Name	State	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
PWT	BREMERTON NATIONAL	WA	LPV	0	1	0	1	2	0.9998
EPH	EPHRATA MUNI	WA	LPV	0	1	0	1	1	1
FHR	FRIDAY HARBOR	WA	LPV	0	1	0	1	4	0.9999
JVL	SOUTHERN WISCONSIN REGIONAL	WI	LPV200	0	1	0	1	0	1
RNH	NEW RICHMOND REGIONAL	WI	LPV	0	1	0	1	1	1
ARV	LAKELAND/NOBLE F. LEE MEMORIAL FIELD	WI	LPV	0	1	0	1	1	1
UES	WAUKESHA COUNTY	WI	LPV200	0	1	0	1	0	1
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	1	0	1	0	1
OVS	BOSCOBEL	WI	LPV	0	1	0	1	0	1
RHI	RHINELANDER-ONEIDA COUNTY	WI	LPV200	0	1	0	1	1	1
CLI	CLINTONVILLE MUNI	WI	LPV	0	1	0	1	0	1
CWA	CENTRAL WISCONSIN	WI	LPV200	0	1	0	1	0	1
MDZ	TAYLOR COUNTY	WI	LPV	0	1	0	1	1	1
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV	0	1	0	1	0	1
TKV	TOMAHAWK RGNL	WI	LP	0	1	0	1	1	1
ASX	JOHN F. KENNEDY MEMORIAL	WI	LPV	0	1	0	1	1	1
UNU	DODGE COUNTY	WI	LPV	0	1	0	1	0	1
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	1	0	1	0	1
LUM	MENOMONIE MUNICIPAL-SCORE FIELD	WI	LPV	0	1	0	1	0	1
ETB	WEST BEND MUNI	WI	LPV	0	1	0	1	0	1
DLL	BARABOO WISCONSIN DELLS	WI	LPV	0	1	0	1	0	1
EAU	CHIPPEWA VALLEY REGIONAL	WI	LPV200	0	1	0	1	0	1
HXF	HARTFORD MUNI	WI	LPV	0	1	0	1	0	1
FLD	FOND DU LAC COUNTY	WI	LPV	0	1	0	1	0	1
LSE	LA CROSSE MUNI	WI	LPV	0	1	0	1	0	1
MSN	DANE COUNTY REGIONAL-TRUAX FIELD	WI	LPV200	0	1	0	1	0	1
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	1	0	1	0	1
HYR	SAWYER COUNTY	WI	LPV	0	1	0	1	1	1
ATW	OUTAGAMIE COUNTY REGIONAL	WI	LPV200	0	1	0	1	0	1
RCX	RUSK COUNTY	WI	LPV	0	1	0	1	1	1
PCZ	WAUPACA MUNI	WI	LPV	0	1	0	1	0	1
MFI	MARSHFIELD MUNI	WI	LPV	0	1	0	1	0	1
PBH	PRICE COUNTY	WI	LPV	0	1	0	1	1	1
C35	REEDSBURG MUNI	WI	LP	0	1	0	1	0	1
MTW	MANITOWOC COUNTY	WI	LPV200	0	1	0	1	0	1
LNR	TRI-COUNTY REGIONAL	WI	LPV	0	1	0	1	0	1
OSH	WITTMAN RGNL	WI	LPV	0	1	0	1	0	1
ENW	KENOSHA RGNL	WI	LPV200	0	1	0	1	0	1
8D1	NEW HOLSTEIN MUNI	WI	LPV	0	1	0	1	0	1
CMY	SPARTA/FORT MC COY	WI	LPV	0	1	0	1	0	1
STE	STEVENS POINT MUNI	WI	LPV200	0	1	0	1	0	1
MKE	GENERAL MITCHELL INTERNATIONAL	WI	LPV200	0	1	0	1	0	1
RAC	JOHN H. BATTEN	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
RPD	RICE LAKE REGIONAL - CARL'S FIELD	WI	LPV	0	1	0	1	1	1
RRL	MERRILL MUNI	WI	LPV	0	1	0	1	1	1
GRB	AUSTIN STRAUBEL INTL	WI	LPV200	0	1	0	1	0	1
57C	EAST TROY MUNI	WI	LPV	0	1	0	1	0	1
C29	MIDDLETON MUNI-MOREY FIELD	WI	LPV	0	1	0	1	0	1
EGV	EAGLE RIVER UNION	WI	LPV	0	1	0	1	1	1
HTS	TRI-STATE/MILTON J. FERGUSON	WV	LPV	0	1	0	1	0	1
MGW	MORGANTOWN MUNI-WLB HART FIELD	WV	LPV200	0	1	0	1	0	1
HLG	WHEELING OHIO CO	WV	LPV200	0	1	0	1	0	1
I18	JACKSON COUNTY	WV	LPV200	0	1	0	1	0	1
CRW	YEAGER	WV	LPV200	0	1	0	1	0	1
SXL	SUMMERSVILLE	WV	LP	0	1	0	1	0	1
MRB	EASTERN WV REGIONAL/SHEPHERD	WV	LPV	0	1	0	1	0	1
BLF	MERCER COUNTY	WV	LPV	0	1	0	1	0	1
W22	UPSHUR COUNTY REGIONAL	WV	LPV	0	1	0	1	0	1
PKB	MID-OHIO VALLEY REGIONAL	WV	LPV	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
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	1	0	1	0	1
LWB	GREENBRIER VALLEY	WV	LPV	0	1	0	1	0	1
RWL	RAWLINS MUNI/HARVEY FIELD	WY	LPV	0	1	0	1	0	1
RIW	RIVERTON REGIONAL	WY	LPV200	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
LAR	LARAMIE REGIONAL	WY	LPV	0	1	0	1	0	1
7V6	CAMP GUERNSEY	WY	LP	0	1	0	1	0	1
CYS	CHEYENNE RGNL/JERRY OLSON FIELD	WY	LPV	0	1	0	1	0	1
COD	YELLOWSTONE REGIONAL	WY	LPV	0	1	0	1	0	1
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	0	1	0	1	0	1
EVW	EVANSTON-UINTA COUNTY BURNS FIELD	WY	LPV	0	1	0	1	0	1
JAC	JACKSON HOLE	WY	LPV	0	1	0	1	0	1
RKS	ROCK SPRINGS-SWEETWATER COUNTY	WY	LPV200	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
CPR	NATRONA COUNTY INTL	WY	LPV	0	1	0	1	0	1
CYQH	Watson Lake	YT	LPV	3	0.9994	2	0.9985	2	0.9974
CYXY	Whitehorse / Erik Nielsen Intl	YT	LPV	1	0.9993	3	0.9987	4	0.9973

Figure 8.1 WAAS LP Availability at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

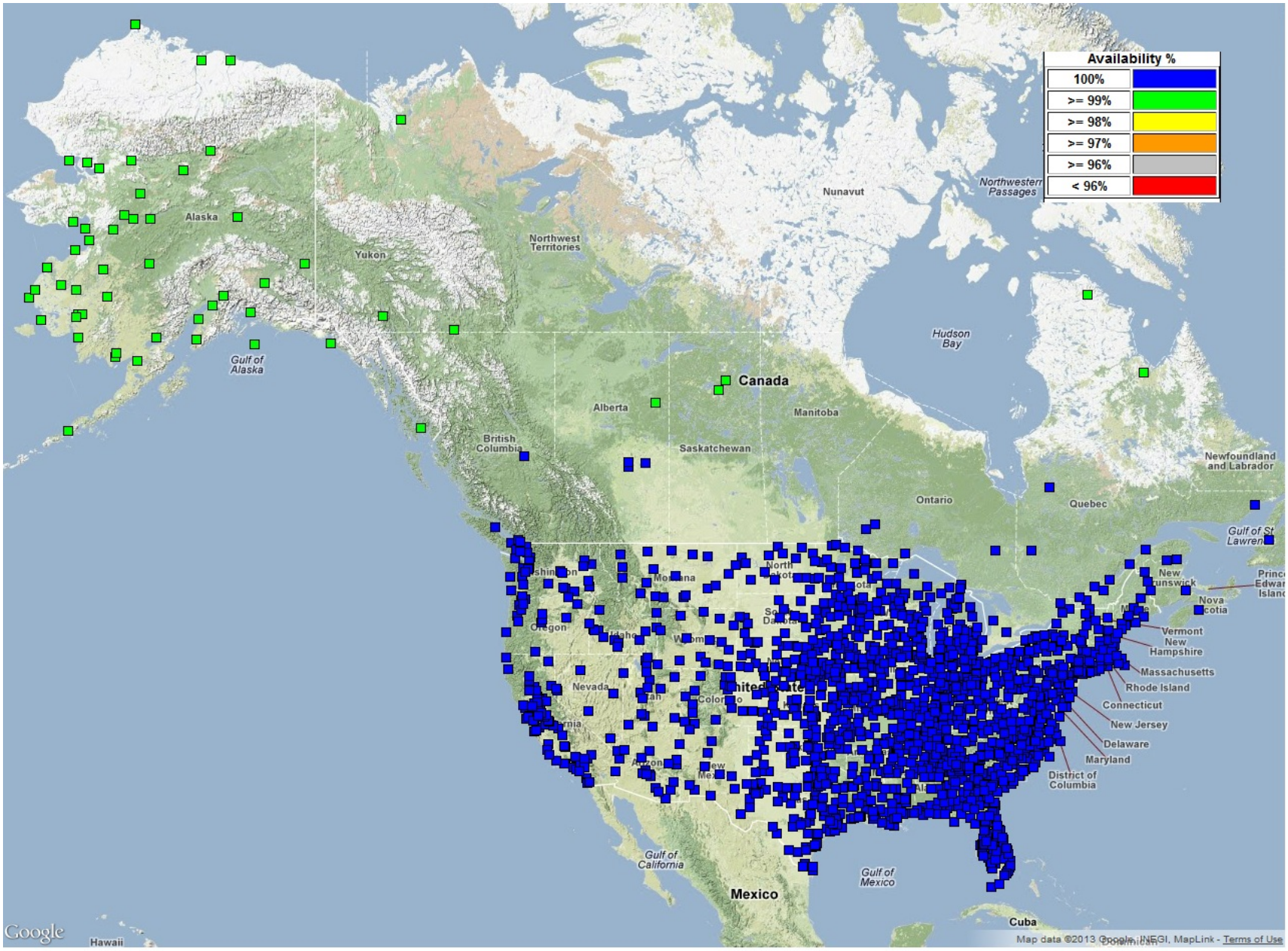


Figure 8.2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

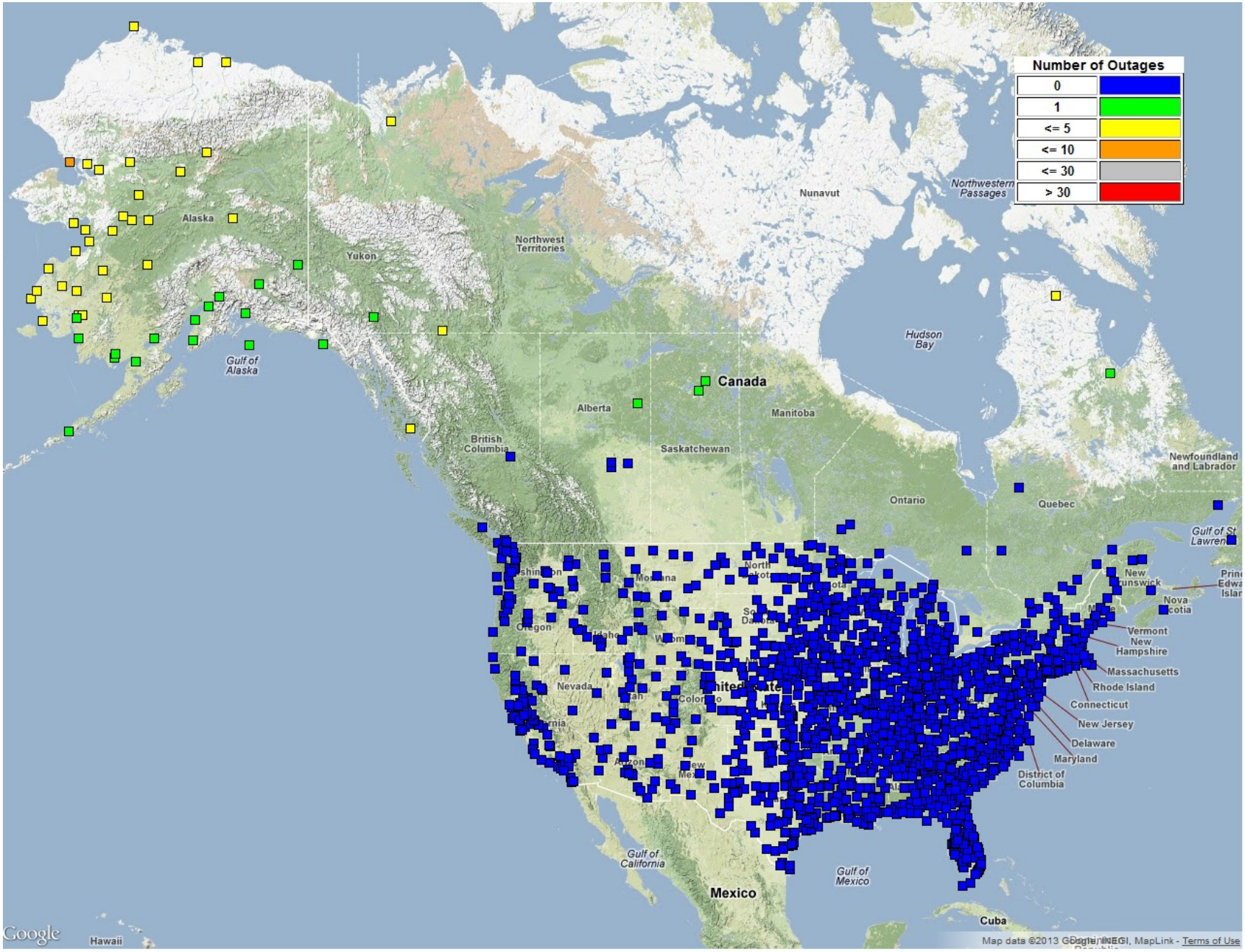


Figure 8.3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

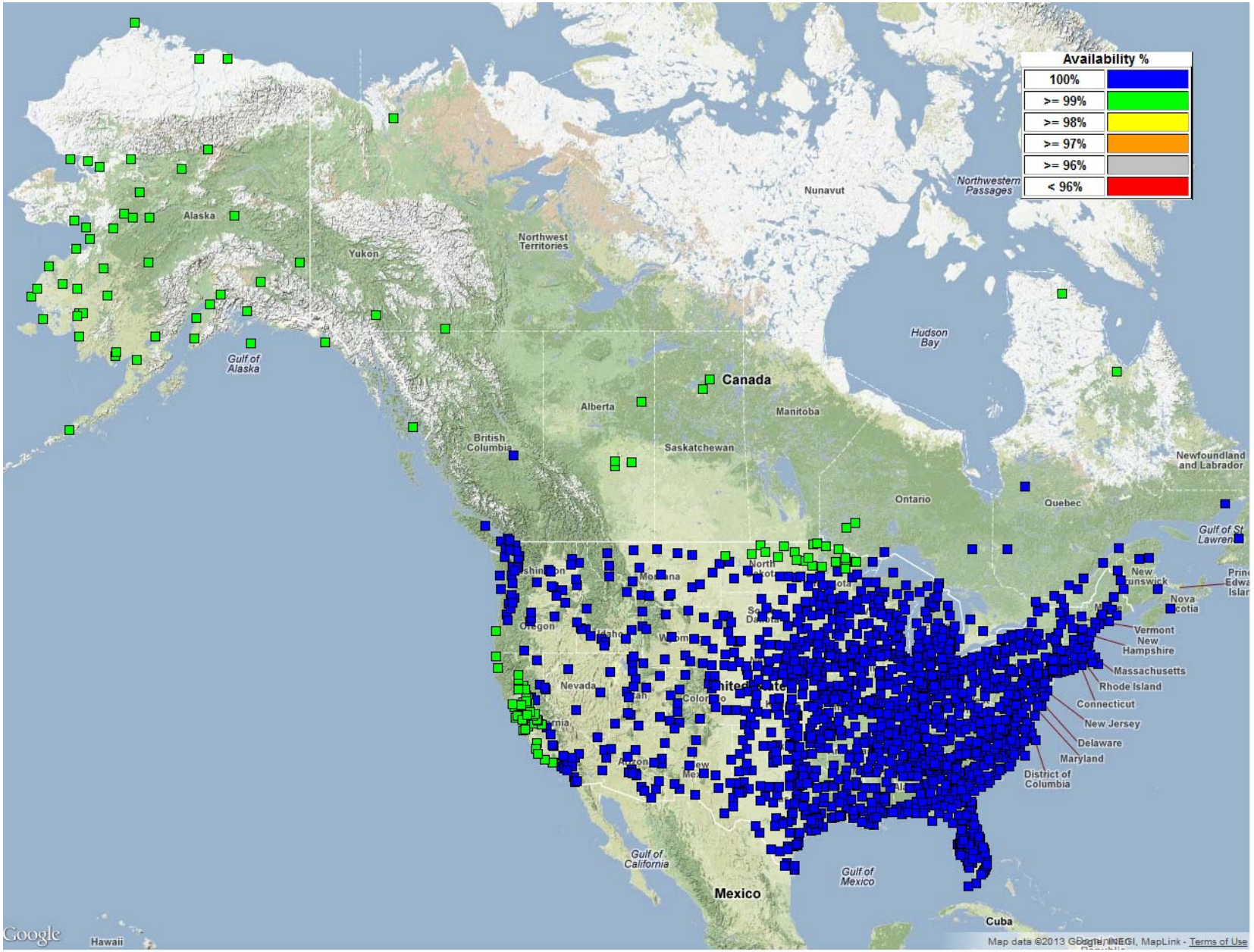


Figure 8.4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

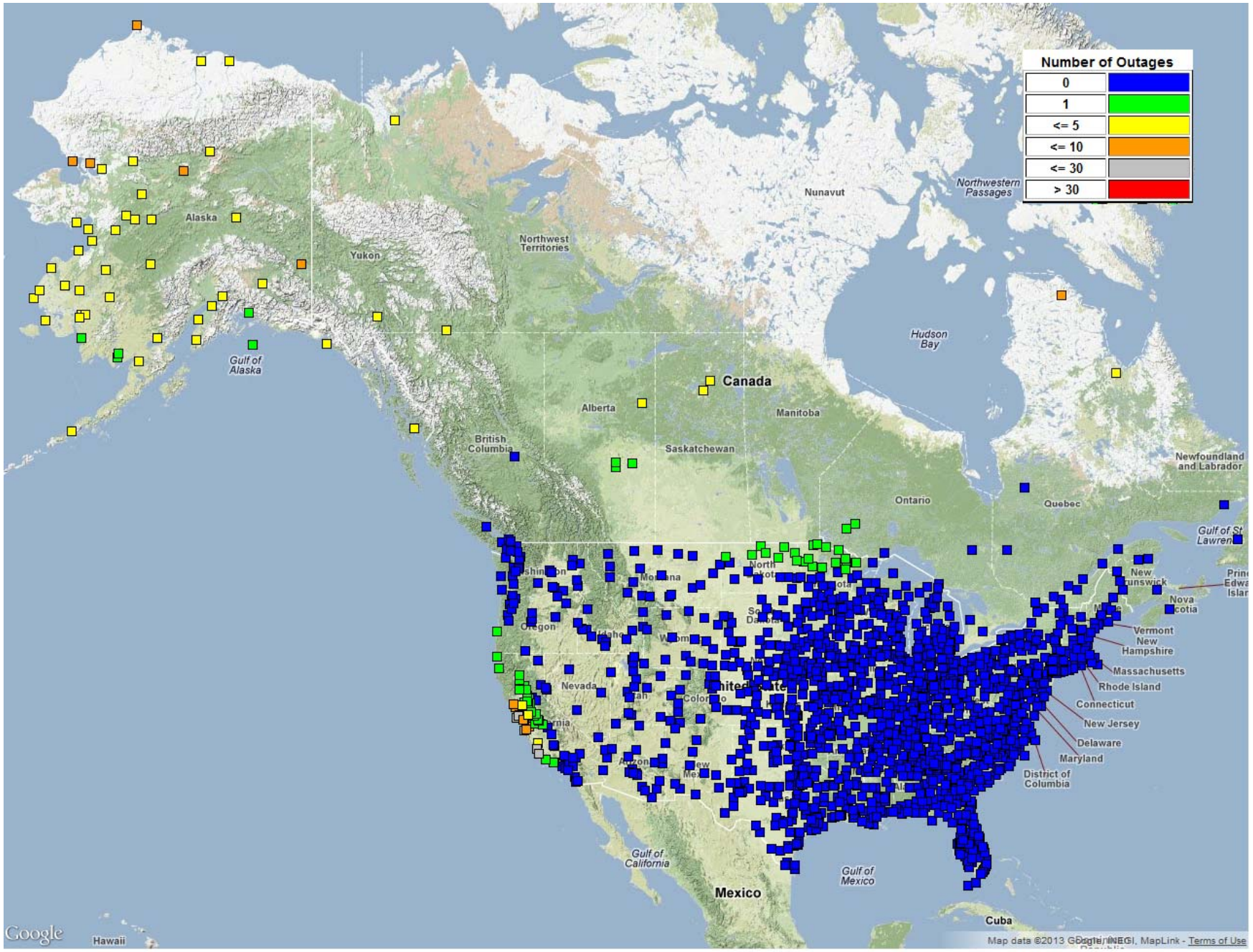


Figure 8.5 WAAS LPV 200 Availability at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

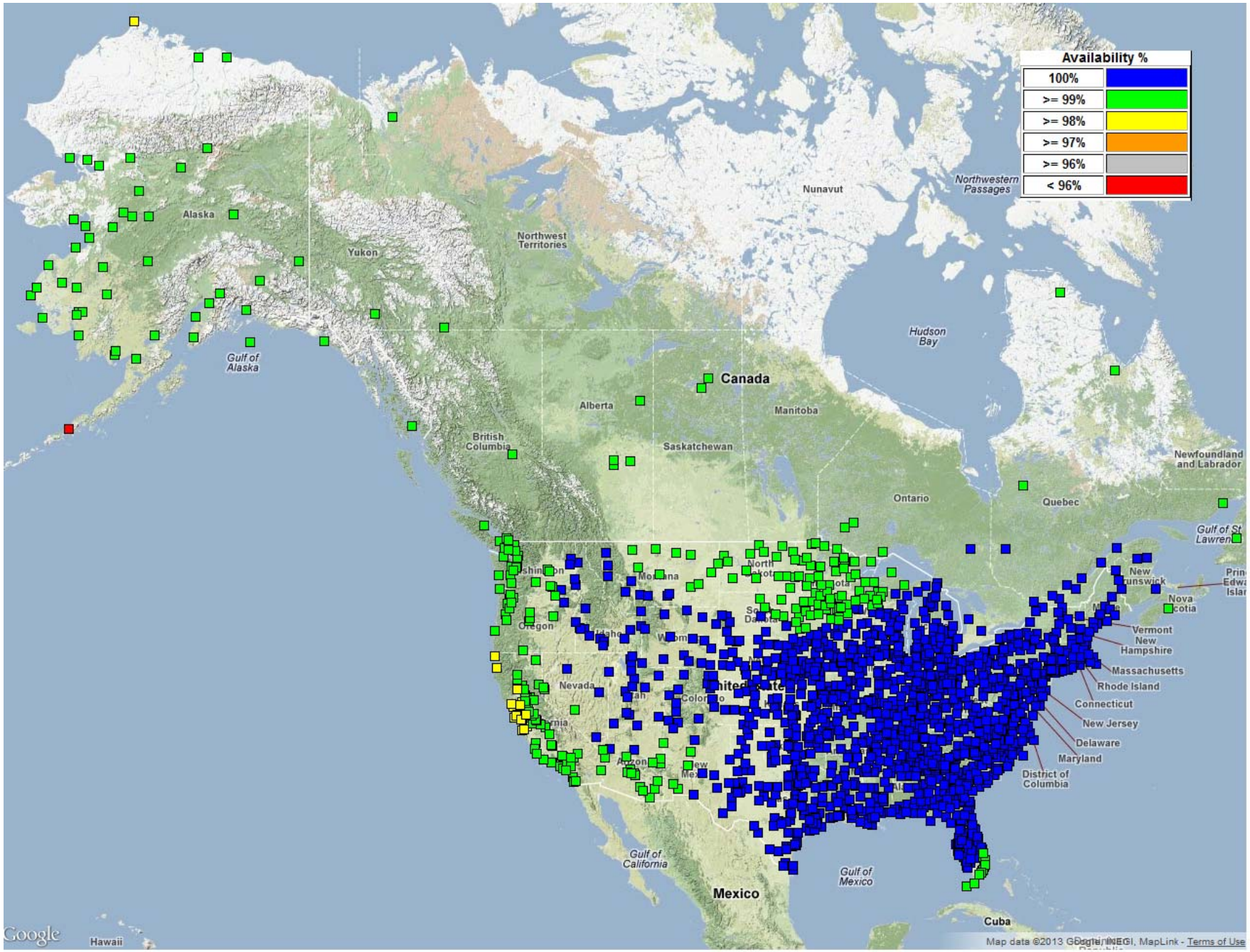
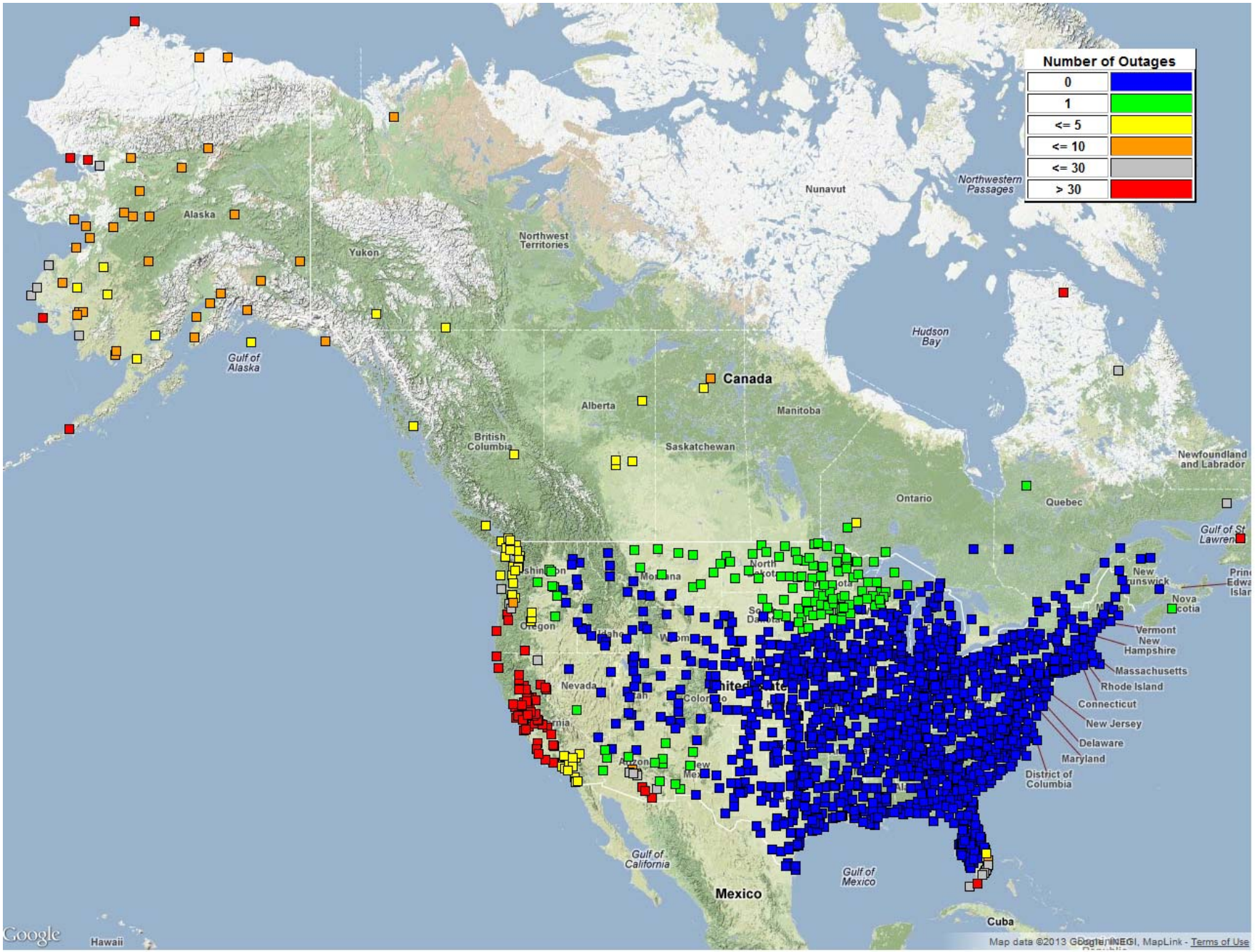


Figure 8.6 WAAS LPV 200 Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures



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 12	Feb 12	Mar 12	Apr 12	May 12	Jun 12	Jul 12	Aug 12	Sep 12	Oct 12	Nov 12	Dec 12
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 12	Feb 12	Mar 12	Apr 12	May 12	Jun 12	Jul 12	Aug 12	Sep 12	Oct 12	Nov 12	Dec 12
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%
● **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

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 23:00:00 on 12/31/12 to 23:59:30 on 1/1/13, and 23:00:00 on 12/29/12 to 23:59:30 on 12/30/12. 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 was selected 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. Prior reports used an older value of -0.4626 meters in the OPUS processing.

The New Year's Day set was intended to be the set for this report but OPUS could not process that data, possibly due to the set straddling the calendar year boundary (CSRS had no problems) therefore the earlier 12/30/12 data set was utilized for this report. CSRS solutions were obtained for both data sets and were compared for the sake of completeness. The two CSRS solution sets agreed with an average difference of 1.0 cm. and with the maximum difference of 2.1 cm. at San Jose del Cabo thread A (MSD1). The 2nd and 3rd largest differences were also at San Jose del Cabo, MSD2 was 2.05 cm, and MSD3 was 1.93 cm.

The overall RMS quality metrics reported by OPUS were all <= 2.2 cm. The CSRS surveys' RSSs of the reported ECEF sigmas for the 12/30/12 data set were all <= 9 mm. The OPUS and CSRS surveys for the 12/30/12 data set agreed to an average of 1.7 cm. with a standard deviation of 8 mm. The maximum of difference was 3.9 cm. for ZOA1 (Oakland CA 1).

The OPUS positions were compared to the positions in WAAS software Release 3B which was installed starting in July 2012. With the exceptions of YWG (Winnipeg), MMX (Mexico City), and San Juan (ZSU), the OPUS surveys agree with the Release 3B positions to better or equal to 8.0 cm. (maximum was HNL1, Honolulu Hawaii 1). The average difference excluding YWG, MMX, and ZSU was 3.5 cm. The YWG deltas were YWG1 = 10.7 cm., YWG2 = 13.1 cm., and YWG3 = 12.0 cm. The MMX deltas were MMX1 = 18.9 cm., MMX2 = 18.5 cm., and MMX3 = 18.8 cm. The ZSU deltas were ZSU1 = 62.4 cm., ZSU2 = 62.7cm., and ZSU3 = 58.9 cm.

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 YWG and ZSU deltas are due to antenna displacement caused by roof construction. The large MMX difference is caused by subsidence. WAAS is currently using YWG (Winnipeg) based on WIPP concurrence. WAAS is not currently utilizing ZSU. ZSU will be returned to service after WAAS Release 4 software is fielded during February 2013.

The OPUS positions were also compared to the positions in WAAS software Release 4 (Build W6.160C) which will be installed during February 2013. The Build W6.160C positions were obtained from the safety critical site specific parameter (SSP) binary files for Build W6.160C. With the exceptions MMX, the OPUS surveys agree with the Release 4 positions with an average of 2.4 cm. with a maximum of 6.6 cm. at HNL3 (Honolulu Hawaii). The Mexico City differences are: MMX1 16.6 cm. MMX2 17.1 cm. and MMX3 16.5 cm. The Release 4 positions have been interpolated forward in time to 8/1/13 to anticipate tectonic plate movement and the MMX subsidence. The values in the binary SSP files for build W6.160C agree exactly with the 12/4/12 Excel spreadsheet from AJW-B2 with the exception of MMX which has negligible differences on the order of 0.4 mm. The MMX differences are because the values in the spreadsheet for MMX use 4 decimal places of precision for values in meters while the SSP files use 3 decimal places.

Table 10-1 lists the WAAS antenna L1 phase center positions as of 12/30/12. The positions are the OPUS estimated positions in IGS08.

Figures 10-1 to 10-3 show the RSS of the ECEF differences between the 12/30/12 OPUS survey antenna phase center locations and the locations in the WAAS Release 3B software which was fielded starting July 2012. Figures 10-13 to 10-15 show the RSS of the ECEF differences between the 12/30/12 OPUS survey antenna phase center locations and the locations in the WAAS Release 4 software (Build W6.160C) which will be fielded starting February 2013. Figures 10-16 to 10-18 show the RSS of the ECEF differences between the WAAS Release 3B and

Release 4 positions. 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 the Canadian Spatial Reference System (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.

Table 10-1 WAAS Antenna Positions (OPUS IGS08) as of 9/29/12

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
BET1	-2965385.026	-972576.615	5543892.900	60.7879156444444	-161.8417249805560	52.175
BET2	-2965385.802	-972580.338	5543891.847	60.7878961666667	-161.8416644722220	52.182
BET3	-2965388.370	-972577.474	5543890.968	60.7878801944444	-161.8417291277780	52.170
BIL1	-1416445.871	-4223576.998	4550862.150	45.8037069694444	-108.5397230361110	1112.227
BIL2	-1416449.939	-4223574.862	4550862.868	45.8037161916667	-108.5397813777780	1112.232
BIL3	-1416441.580	-4223574.270	4550865.997	45.8037565722222	-108.5396818666670	1112.231
BRW1	-1886758.903	-809058.660	6018494.487	71.2827651194444	-156.7899246277780	15.575
BRW2	-1886756.330	-809055.908	6018495.663	71.2827977805556	-156.7899669194440	15.582
BRW3	-1886755.237	-809059.692	6018495.484	71.2827931333333	-156.7898578333330	15.569
CDB1	-3484099.037	-1084748.805	5213678.641	55.1923742611111	-162.7064042777780	49.702
CDB2	-3484105.674	-1084741.594	5213675.696	55.1923282333333	-162.7065433611110	49.678
CDB3	-3484111.947	-1084734.832	5213672.952	55.1922848138889	-162.7066740138890	49.696
FAI1	-2304741.791	-1448715.270	5748843.674	64.8096301444444	-147.8473408111110	149.916
FAI2	-2304741.325	-1448706.455	5748846.067	64.8096805555556	-147.8474926666670	149.917
FAI3	-2304732.771	-1448707.404	5748849.218	64.8097472638889	-147.8473799444440	149.901
HNL1	-5508637.111	-2234493.284	2303722.211	21.3129904277778	-157.9208277833330	24.676
HNL2	-5508656.262	-2234483.601	2303686.965	21.3126475611111	-157.9209836500000	25.008
HNL3	-5508647.685	-2234497.566	2303694.048	21.3127160166667	-157.9208278472220	25.068
JNU1	-2354254.883	-2388549.647	5407043.114	58.3625746805556	-134.5857069416670	16.096
JNU2	-2354252.796	-2388565.755	5407036.940	58.3624691138889	-134.5854883722220	16.088
JNU3	-2354239.571	-2388568.607	5407041.406	58.3625455805556	-134.5852932583330	16.086
MMD1	35070.442	-5959686.653	2264365.789	20.9319094944444	-89.6628404750000	29.114
MMD2	35065.506	-5959687.033	2264364.983	20.9319015638889	-89.6628879500000	29.154
MMD3	35065.155	-5959685.241	2264369.641	20.9319466472222	-89.6628912222222	29.143
MMX1	-948701.062	-5943935.441	2109212.657	19.4316536222222	-99.0683895527778	2235.420
MMX2	-948696.631	-5943935.271	2109215.081	19.4316768694444	-99.0683481555556	2235.409
MMX3	-948705.511	-5943935.628	2109210.233	19.4316303194444	-99.0684310916667	2235.449
MPR1	-1570142.213	-5759530.605	2238184.760	20.6790033611111	-105.2492031388890	10.978
MPR2	-1570139.394	-5759530.113	2238188.814	20.6790415000000	-105.2491782777780	11.272
MPR3	-1570143.493	-5759527.995	2238190.568	20.6790594000000	-105.2492215805560	10.988
MSD1	-1979519.748	-5523223.026	2493106.804	23.1604470722222	-109.7176483972220	104.275
MSD2	-1979521.314	-5523225.350	2493100.403	23.1603842861111	-109.7176551361110	104.255
MSD3	-1979525.767	-5523222.093	2493104.079	23.1604203555556	-109.7177068027780	104.263
MTP1	-254854.348	-6162909.157	1617805.074	14.7913660916667	-92.3679991361111	54.935
MTP2	-254850.723	-6162910.204	1617801.637	14.7913339888889	-92.3679650916667	54.924
MTP3	-254855.492	-6162910.314	1617800.114	14.7913199722222	-92.3680093083333	54.832

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
OTZ1	-2396056.017	-750356.167	5843502.526	66.8873322166667	-162.6113727666670	10.894
OTZ2	-2396052.839	-750354.340	5843504.052	66.8873671027778	-162.6113908777780	10.893
OTZ3	-2396052.828	-750358.274	5843503.565	66.8873557805556	-162.6113051333330	10.903
YFB1	1035381.448	-2634289.635	5696539.524	63.7314904972222	-68.5431833722222	10.011
YFB2	1035372.245	-2634296.047	5696538.178	63.7314642305556	-68.5434042333333	9.955
YFB3	1035366.162	-2634306.798	5696534.381	63.7313865638889	-68.5435984416667	9.994
YQX1	2430424.636	-3419640.384	4788223.822	48.9664899861111	-54.5976320750000	146.867
YQX2	2430432.597	-3419639.039	4788220.761	48.9664480694444	-54.5975328111111	146.866
YQX3	2430440.498	-3419637.674	4788217.768	48.9664069027778	-54.5974340611111	146.883
YWG1	-520164.360	-4083475.912	4855843.059	49.9005746583333	-97.2593974500000	222.096
YWG2	-520150.489	-4083468.857	4855850.460	49.9006776972222	-97.2592183388889	222.120
YWG3	-520152.362	-4083477.976	4855842.628	49.9005685055556	-97.2592281611111	222.108
YYR1	1885341.429	-3321428.356	5091171.652	53.3086470944444	-60.4194682055556	37.843
YYR2	1885344.386	-3321419.876	5091176.068	53.3087134194444	-60.4193668250000	37.850
YYR3	1885340.103	-3321413.058	5091182.070	53.3088035972222	-60.4193722138889	37.856
ZAB1	-1488636.826	-5003946.530	3654557.705	35.1735754444444	-106.5673496305560	1620.112
ZAB2	-1488631.503	-5003948.219	3654557.688	35.1735747944444	-106.5672883500000	1620.185
ZAB3	-1488632.270	-5003950.808	3654553.831	35.1735323666667	-106.5672883166670	1620.170
ZAN1	-2659536.627	-1549114.778	5567750.750	61.2292018666667	-149.7802505916670	80.682
ZAN2	-2659548.395	-1549110.830	5567746.273	61.2291181722222	-149.7804243611110	80.696
ZAN3	-2659541.337	-1549106.696	5567750.738	61.2292017972222	-149.7804247305560	80.673
ZAU1	138704.119	-4761244.134	4227763.926	41.7826580583333	-88.3313366472222	195.879
ZAU2	138704.393	-4761248.758	4227758.772	41.7825956833333	-88.3313349722222	195.897
ZAU3	138711.074	-4761248.505	4227758.848	41.7825965444444	-88.3312545555555	195.904
ZBW1	1490299.232	-4448983.158	4306010.492	42.7357205250000	-71.4804256750000	39.105
ZBW2	1490304.332	-4448981.144	4306010.830	42.7357245277778	-71.4803588083333	39.122
ZBW3	1490306.045	-4448984.777	4306006.528	42.7356717166667	-71.4803530666667	39.132
ZDC1	1069125.767	-4839598.983	4001126.500	39.1015958638889	-77.5427464750000	80.057
ZDC2	1069128.179	-4839603.619	4001120.290	39.1015237833333	-77.5427308083333	80.057
ZDC3	1069124.066	-4839602.710	4001122.493	39.1015492666667	-77.5427749694444	80.069
ZDV1	-1273628.596	-4711375.565	4094890.120	40.1873034083333	-105.1272242027780	1541.351
ZDV2	-1273622.896	-4711377.079	4094890.128	40.1873036166667	-105.1271549666670	1541.337
ZDV3	-1273624.911	-4711380.280	4094885.845	40.1872531472222	-105.1271679972220	1541.335
ZFW1	-659983.189	-5324060.780	3438276.473	32.8306497277778	-97.0664716805556	155.621
ZFW2	-659988.439	-5324063.323	3438271.500	32.8305965555556	-97.0665239833333	155.588
ZFW3	-659983.468	-5324063.854	3438271.687	32.8305983861111	-97.0664706000000	155.619
ZHU1	-513864.464	-5506451.701	3166720.476	29.9618964000000	-95.3314262000000	10.847
ZHU2	-513867.110	-5506455.105	3166714.317	29.9618318861111	-95.3314502194444	10.920
ZHU3	-513873.394	-5506457.741	3166708.709	29.9617736027778	-95.3315125027778	10.899

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZJX1	772646.453	-5434462.202	3237231.777	30.6988598555556	-81.9081850333333	2.166
ZJX2	772649.776	-5434463.738	3237228.342	30.6988240555556	-81.9081529500000	2.122
ZJX3	772645.721	-5434466.172	3237225.251	30.6987916138889	-81.9081984333333	2.125
ZKC1	-415247.517	-4954556.381	3982161.116	38.8801594555556	-94.7908338416667	305.892
ZKC2	-415231.119	-4954557.720	3982161.166	38.8801600055556	-94.7906442444444	305.896
ZKC3	-415237.231	-4954561.053	3982155.988	38.8801020305556	-94.7907112250000	305.628
ZLA1	-2474409.937	-4637294.657	3602183.545	34.6035183472222	-118.0838953444440	763.524
ZLA2	-2474404.660	-4637297.458	3602183.552	34.6035184666667	-118.0838302222220	763.517
ZLA3	-2474411.245	-4637297.133	3602179.558	34.6034744361111	-118.0838952194440	763.565
ZLC1	-1808273.201	-4486410.820	4145303.022	40.7860433555556	-111.9521774222220	1287.429
ZLC2	-1808274.600	-4486414.426	4145298.528	40.7859899750000	-111.9521768250000	1287.421
ZLC3	-1808270.407	-4486416.129	4145298.525	40.7859898833333	-111.9521232194440	1287.428
ZMA1	966042.313	-5662999.808	2761581.521	25.8246124250000	-80.3191896444444	-7.589
ZMA2	966029.328	-5662999.115	2761585.994	25.8246600388889	-80.3193161444444	-8.221
ZMA3	966037.414	-5662997.959	2761586.350	25.8246620666667	-80.3192347083333	-7.868
ZME1	4070.897	-5226189.293	3644028.425	35.0673941472222	-89.9553699333333	68.601
ZME2	4070.928	-5226186.746	3644032.537	35.0674376750000	-89.9553695722222	68.879
ZME3	4064.751	-5226186.608	3644032.702	35.0674396305556	-89.9554372916667	68.857
ZMP1	-249978.372	-4539297.499	4458955.053	44.6374632805556	-93.1520853638889	262.654
ZMP2	-249972.569	-4539297.844	4458955.056	44.6374631388889	-93.1520121000000	262.674
ZMP3	-249973.679	-4539302.129	4458950.571	44.6374069833333	-93.1520231000000	262.611
ZNY1	1406144.632	-4627343.987	4144322.052	40.7843285361111	-73.0971657333333	6.448
ZNY2	1406146.449	-4627347.007	4144317.277	40.7842758750000	-73.0971555388889	5.917
ZNY3	1406140.888	-4627348.659	4144317.312	40.7842763250000	-73.0972242638889	5.912
ZOA1	-2684436.860	-4293337.435	3865351.825	37.5430535027778	-122.0159474972220	-3.510
ZOA2	-2684433.842	-4293341.487	3865349.420	37.5430262444444	-122.0158942333330	-3.520
ZOA3	-2684438.216	-4293342.382	3865345.583	37.5429819333333	-122.0159308305560	-3.417
ZOB1	650770.189	-4754715.661	4187420.745	41.2971544750000	-82.2064446500000	223.670
ZOB2	650777.879	-4754714.843	4187422.777	41.2971668416667	-82.2063523638889	225.186
ZOB3	650776.221	-4754719.682	4187415.013	41.2970871666667	-82.2063798111111	223.495
ZSE1	-2308930.263	-3668169.675	4663526.495	47.2869934000000	-122.1883727527780	82.109
ZSE2	-2308934.653	-3668175.227	4663520.081	47.2869077583333	-122.1883827694440	82.170
ZSE3	-2308935.710	-3668179.500	4663516.129	47.2868560277778	-122.1883645027780	82.101
ZSU1	2462589.421	-5529372.128	2003724.456	18.4313356138889	-65.9934769444444	-28.104
ZSU2	2462587.510	-5529377.502	2003712.169	18.4312184972222	-65.9935141638889	-28.069
ZSU3	2462594.137	-5529375.239	2003710.093	18.4311989055556	-65.9934481472222	-28.129
ZTL1	529840.414	-5305248.801	3489342.857	33.3796886833333	-84.2967258833333	261.132
ZTL2	529846.789	-5305247.963	3489343.141	33.3796918166667	-84.2966568194444	261.121
ZTL3	529847.473	-5305251.399	3489337.903	33.3796350833333	-84.2966531750000	261.151

Figure 10-1 WAAS Release 3B Software Antenna Positions Deltas from 12/30/12 OPUS Survey

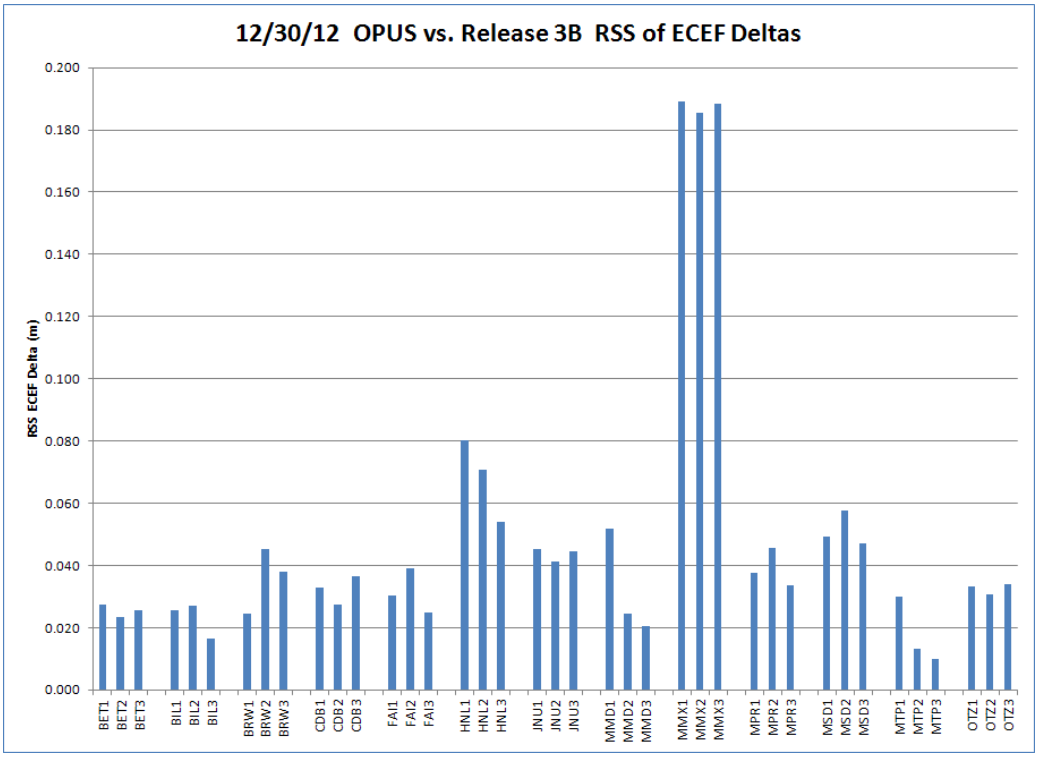


Figure 10-2 WAAS Release 3B Software Antenna Positions Deltas from 12/30/12 OPUS Survey

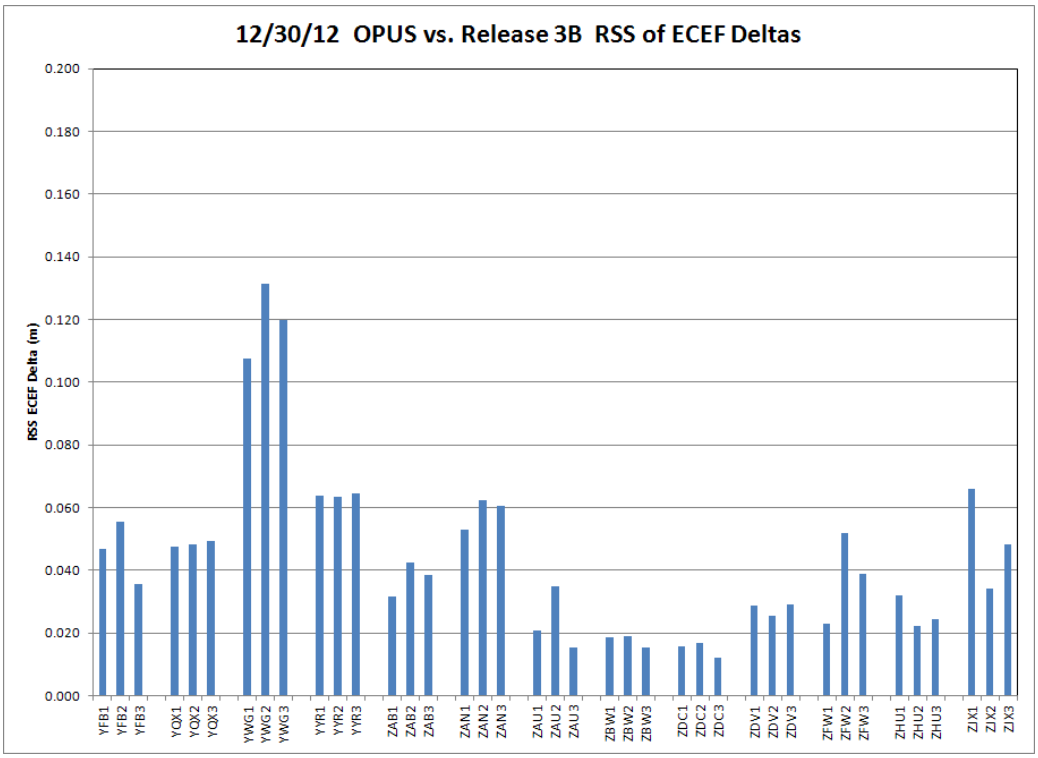


Figure 10-3 WAAS Release 3B Software Antenna Positions Deltas from 12/30/12 OPUS Survey

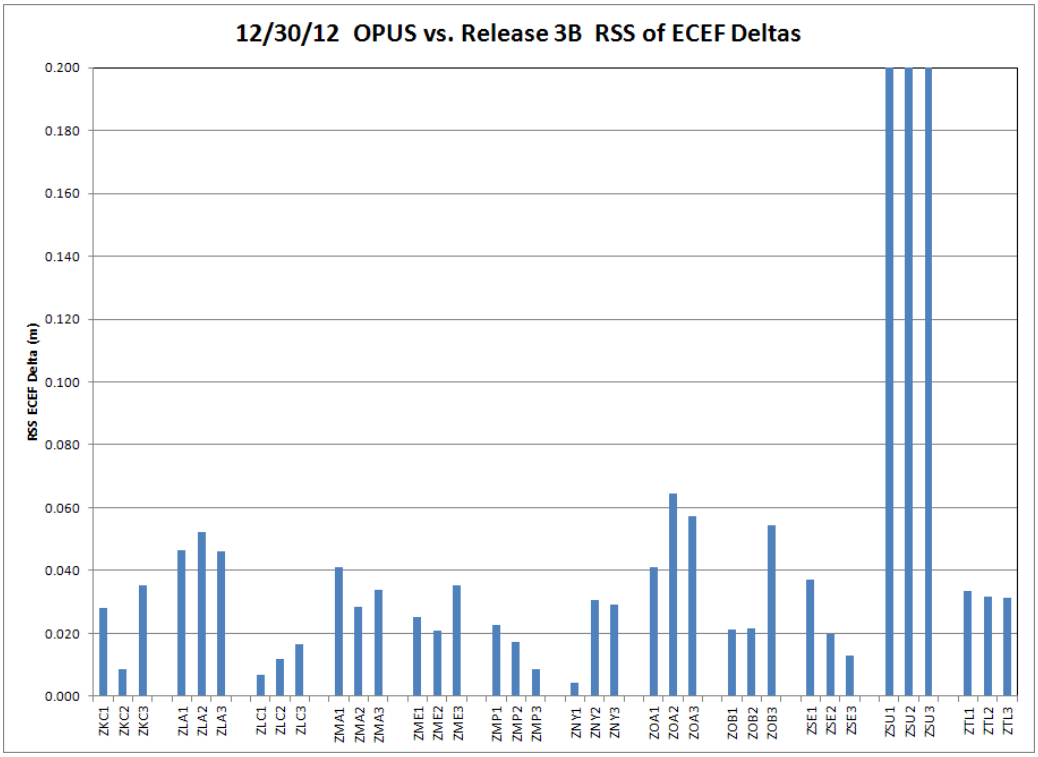


Figure 10-4 12/30/12 OPUS Survey Overall RMS Qualities

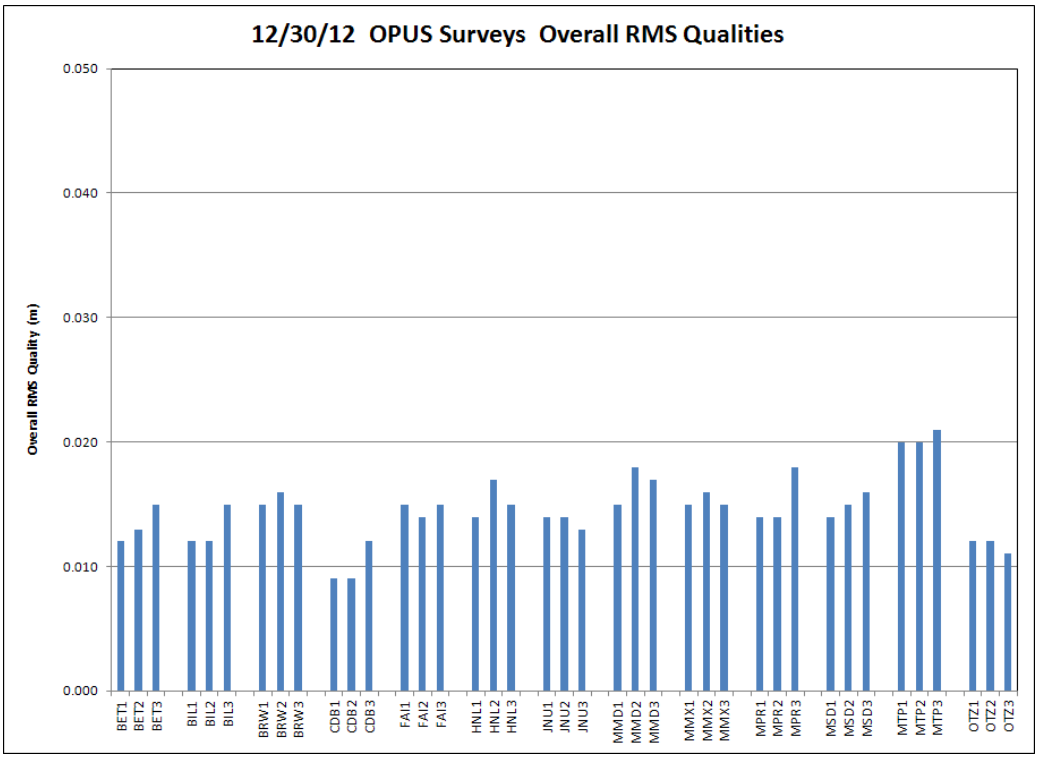


Figure 10-5 12/30/12 OPUS Survey Overall RMS Qualities

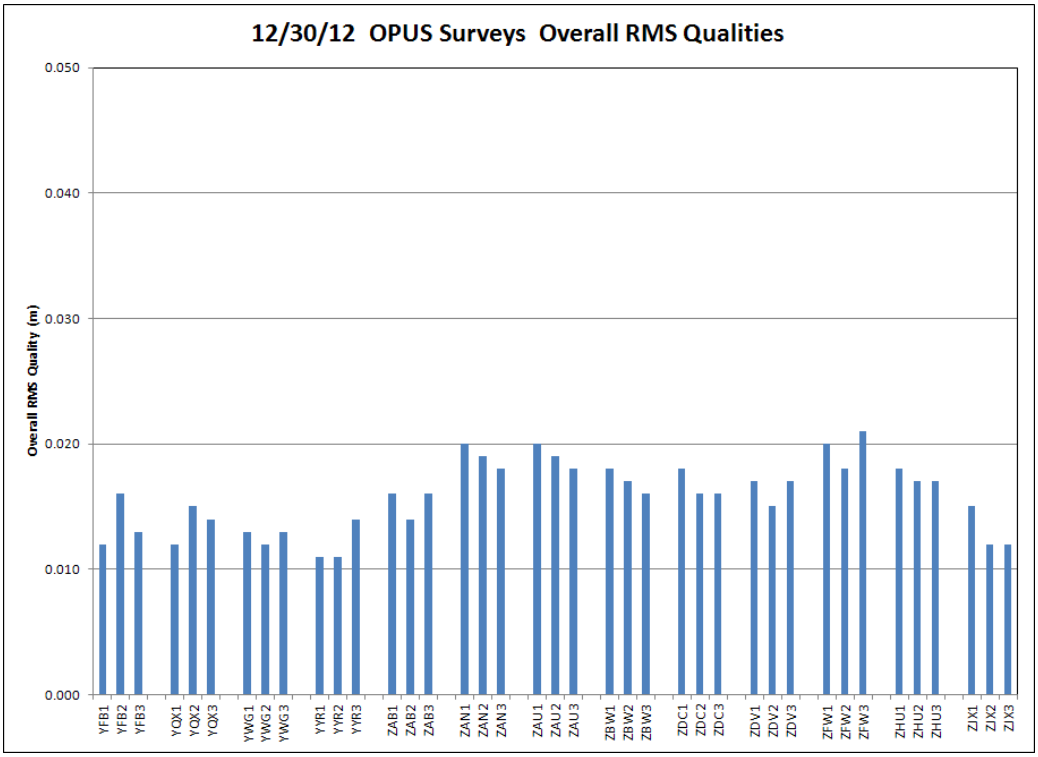


Figure 10-6 12/30/12 OPUS Survey Overall RMS Qualities

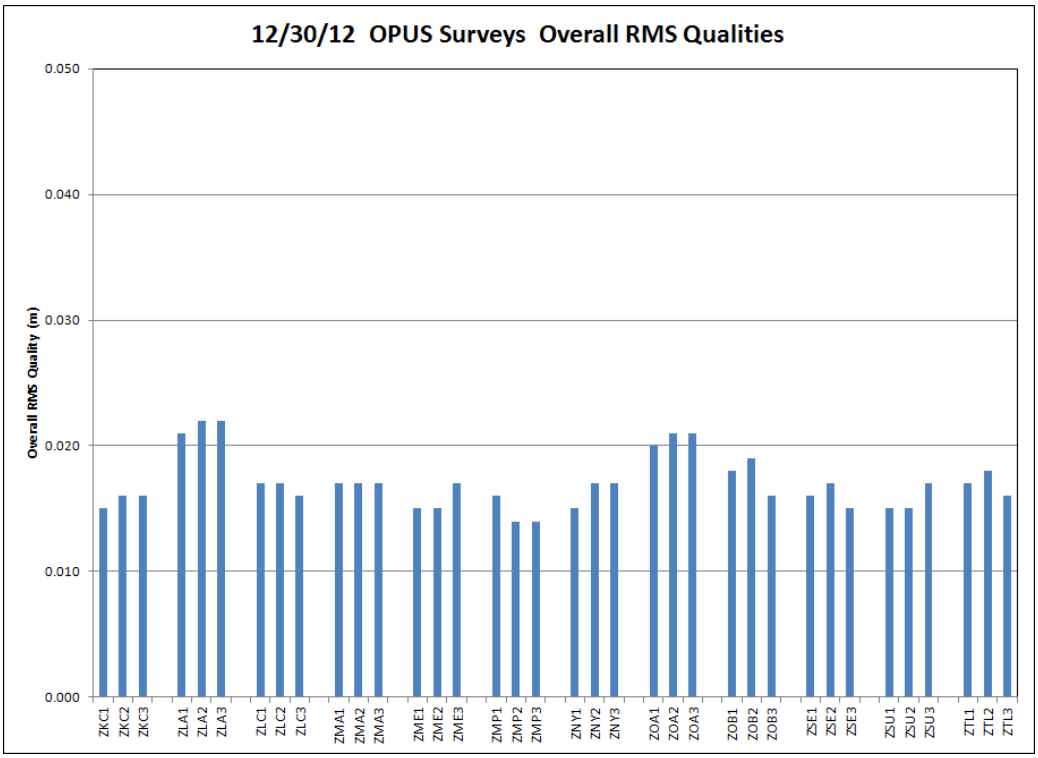


Figure 10-7 12/30/12 OPUS vs. CSRS RSS ECEF Deltas

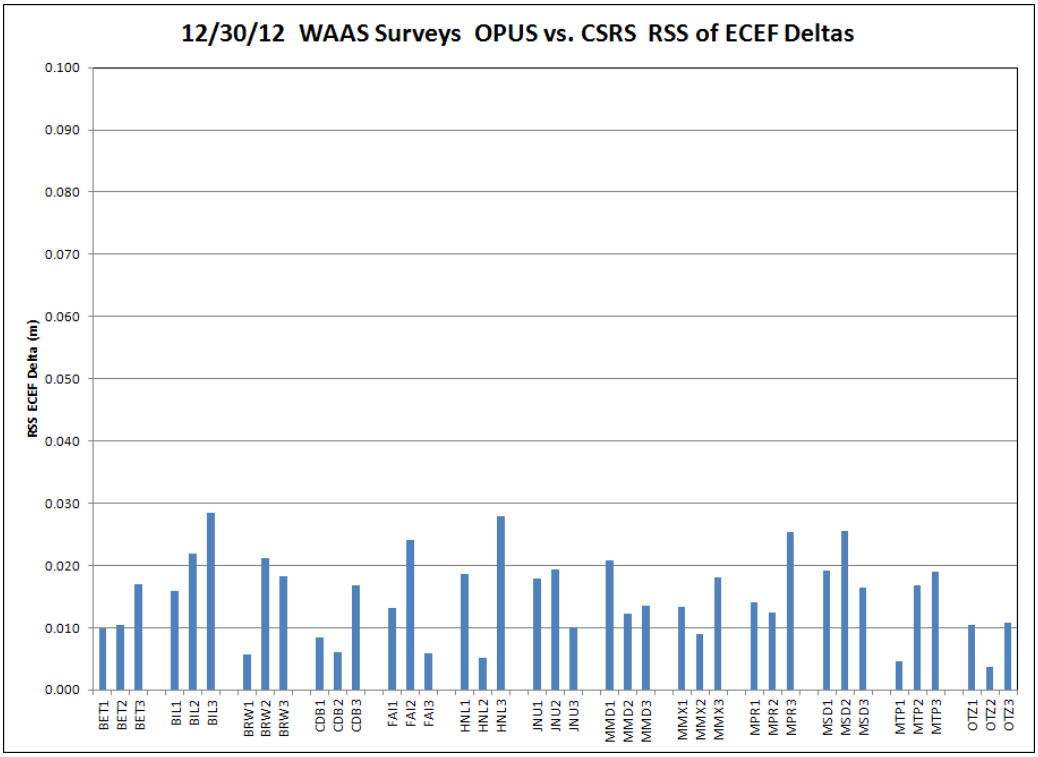


Figure 10-8 12/30/12 OPUS vs. CSRS RSS ECEF Deltas

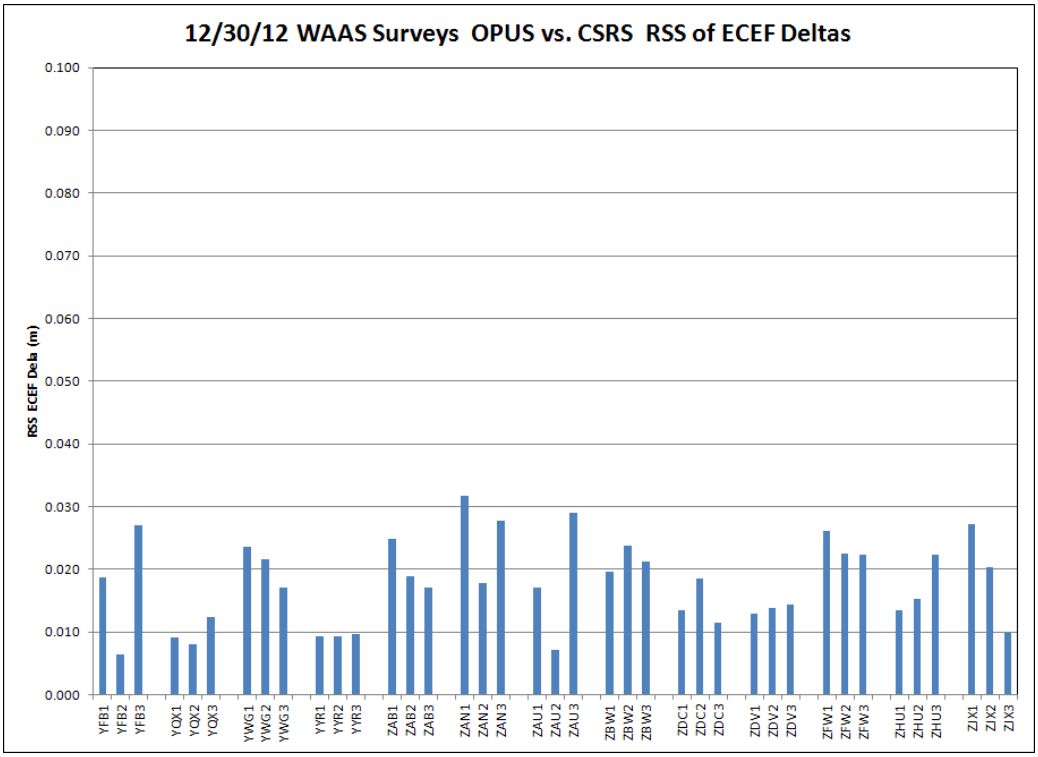


Figure 10-9 12/30/12 OPUS vs. CSRS RSS ECEF Deltas

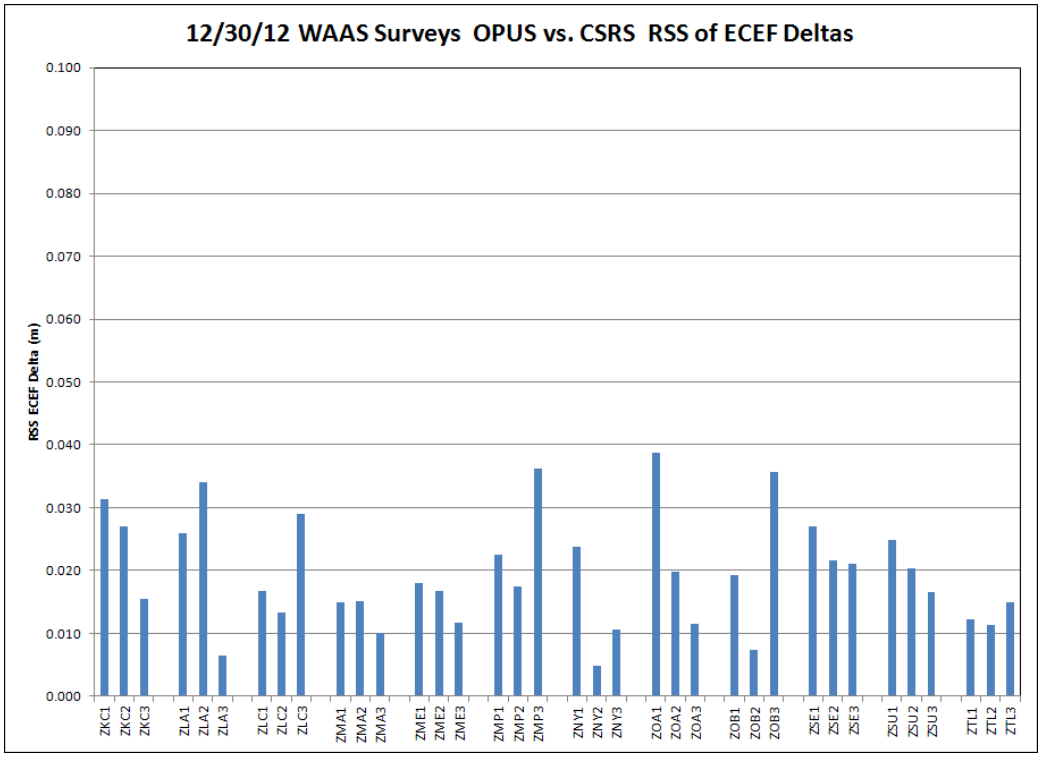


Figure 10-10 12/30/12 CSRS Survey Qualities

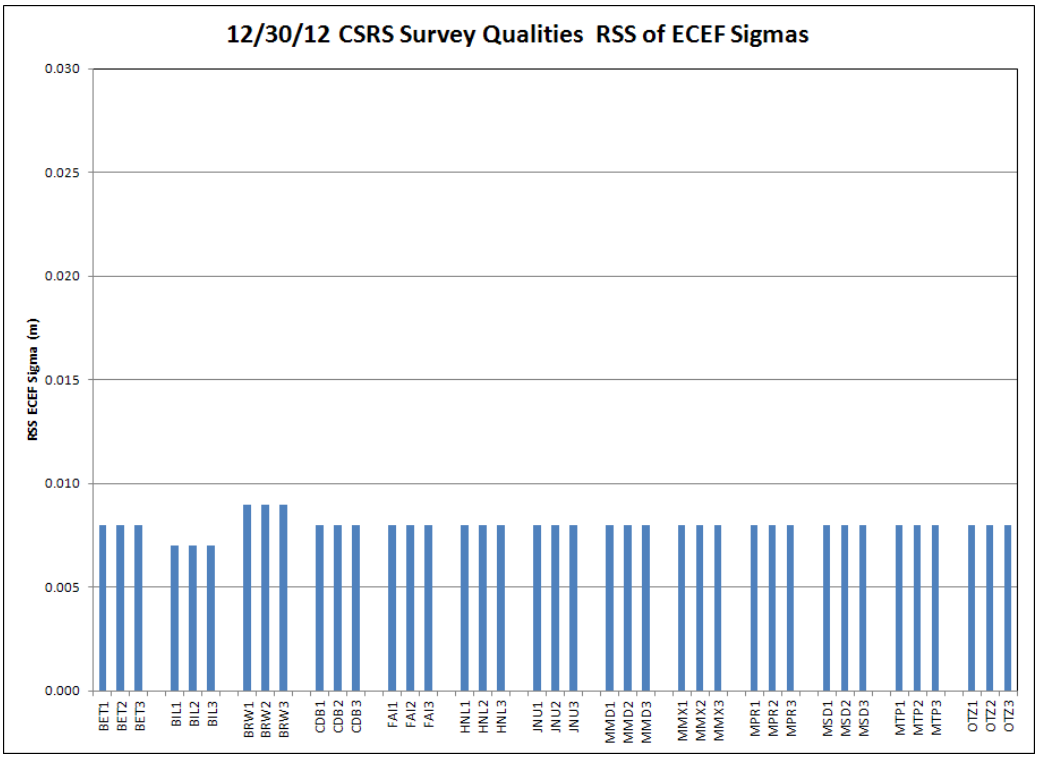


Figure 10-11 12/30/12 CSRS Survey Qualities

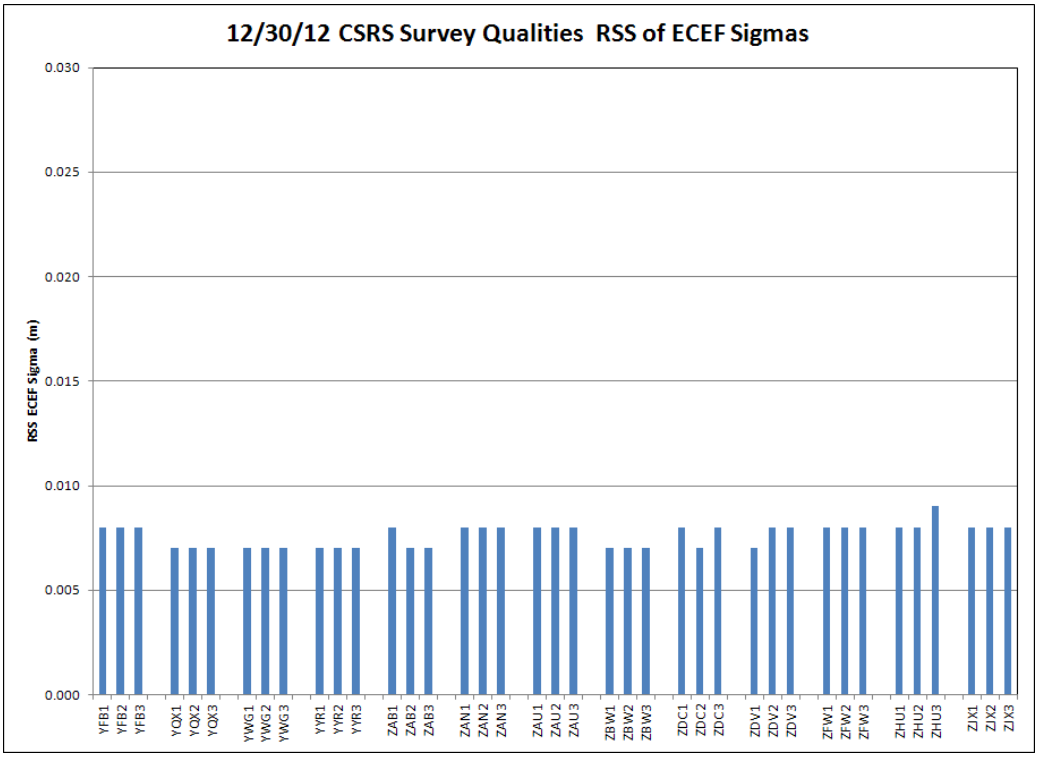


Figure 10-12 12/30/12 CSRS Survey Qualities

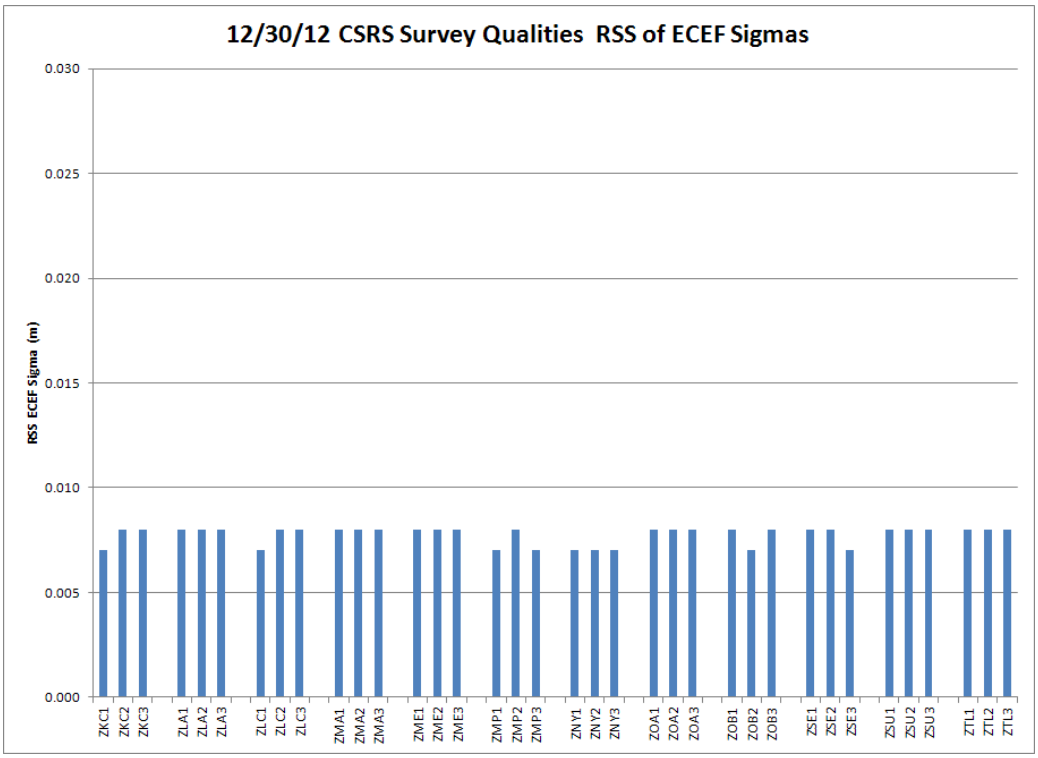


Figure 10-13 Release 4 Software Antenna Positions Deltas from 12/30/12 OPUS Survey

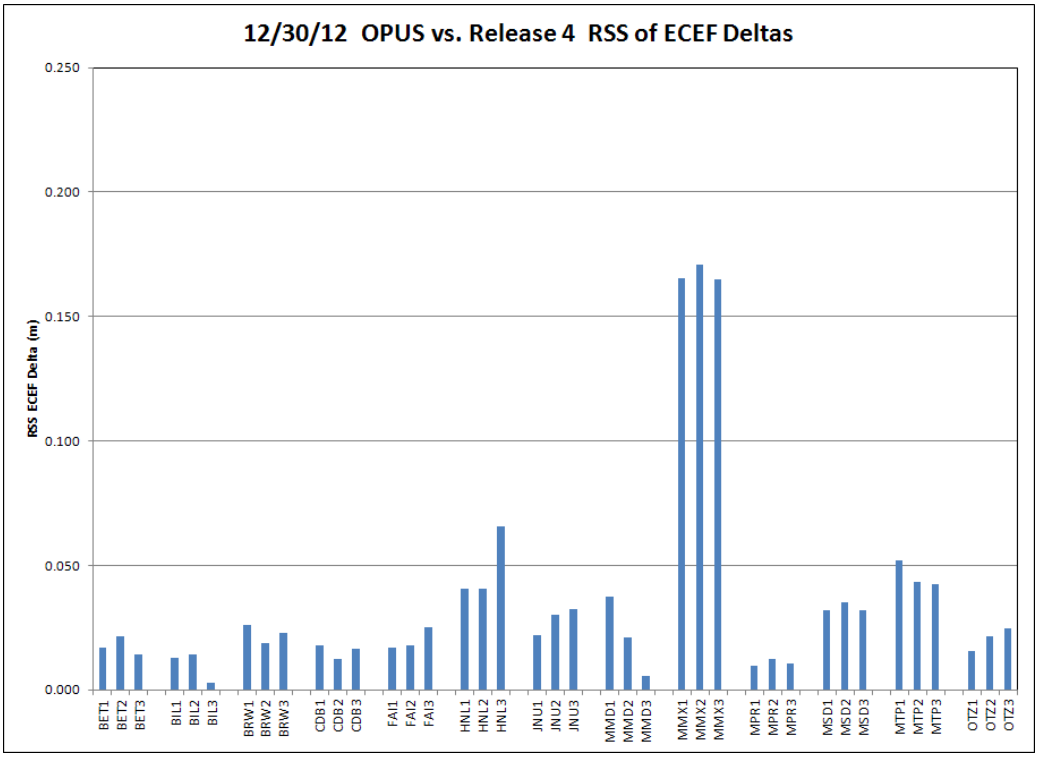
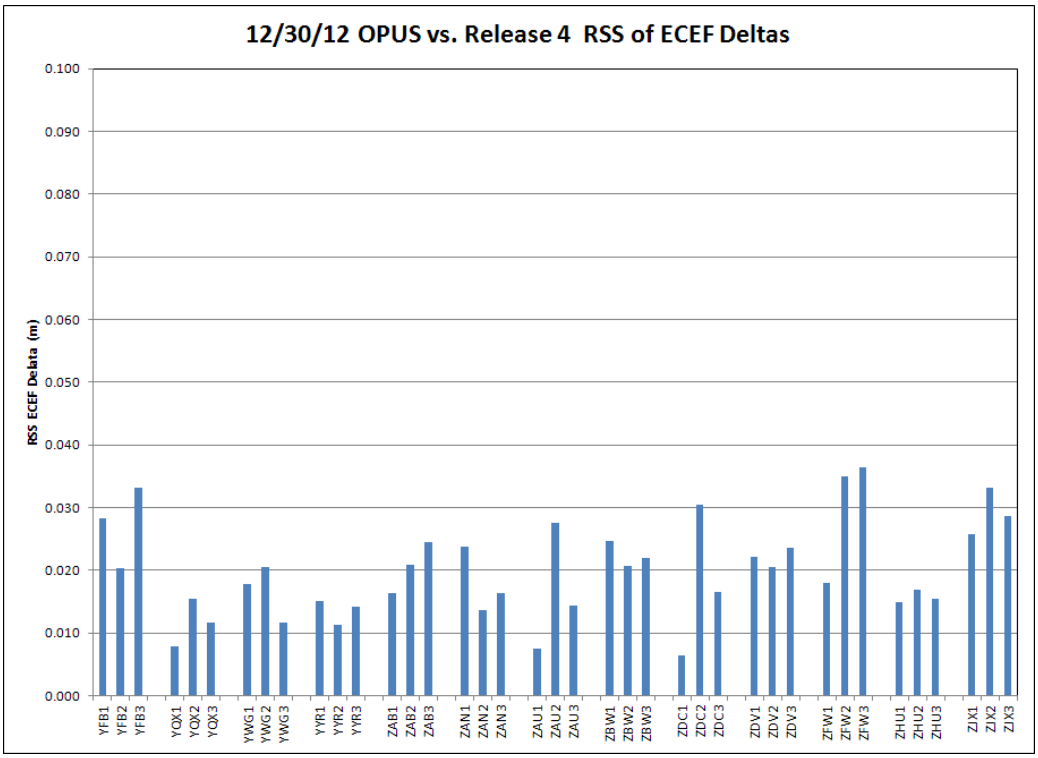


Figure 10-14 Release 4 Software Antenna Positions Deltas from 12/30/12 OPUS Survey



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.

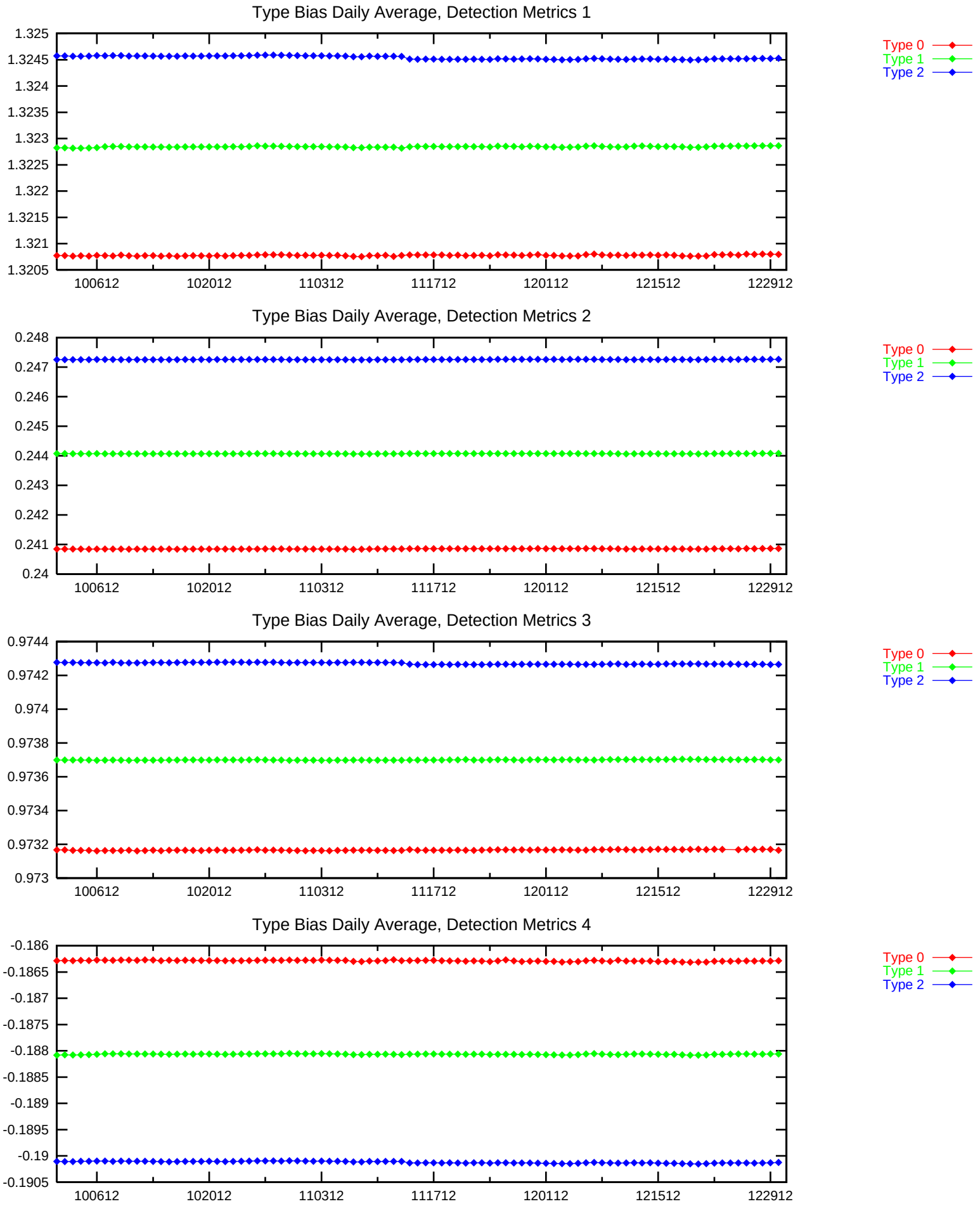
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3207800	1.3228400	1.3245400
DM 2	0.2408510	0.2440710	0.2472560
DM 3	0.9731660	0.9737000	0.9742710
DM 4	-0.1862870	-0.1880650	-0.1901200

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3209300	1.3228800	1.3246000
DM 2	0.2408460	0.2440970	0.2472780
DM 3	0.9731740	0.9737100	0.9742770
DM 4	-0.1861980	-0.1880640	-0.1900950

Figure 11-1 PRN 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 0.009787. The maximum average for DM2 is PRN 25 at 0.0002214. The maximum average for DM3 is PRN 10 at 0.0002709 and the maximum average for DM4 is PRN 23 at 0.0004278.

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. PRN 24 came back online on 11/14/12. PRN 27 went offline from 10/6/12 to the end of the quarter.

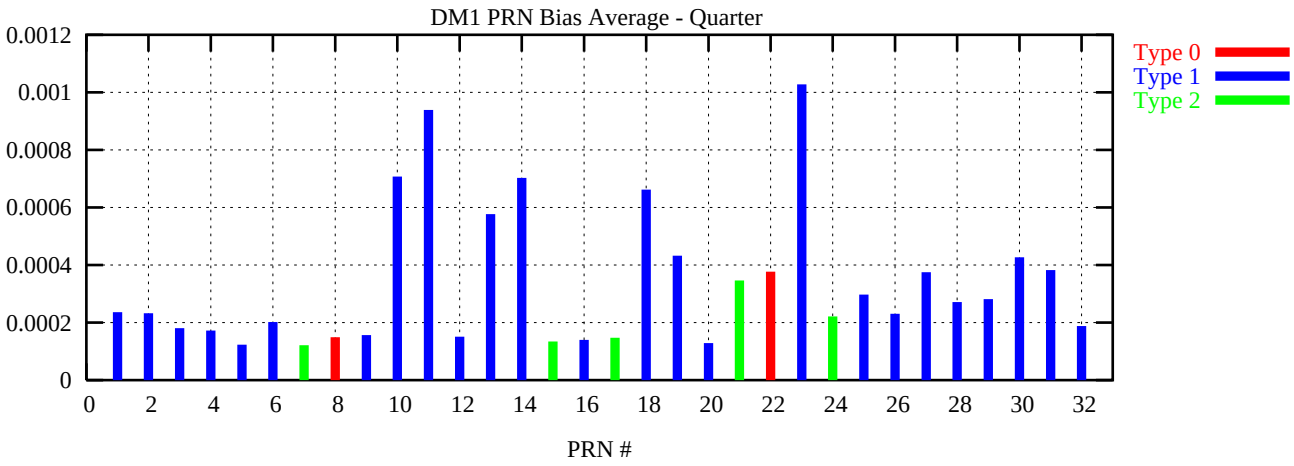
Table 11-4 PRN Bias Average for the Quarter

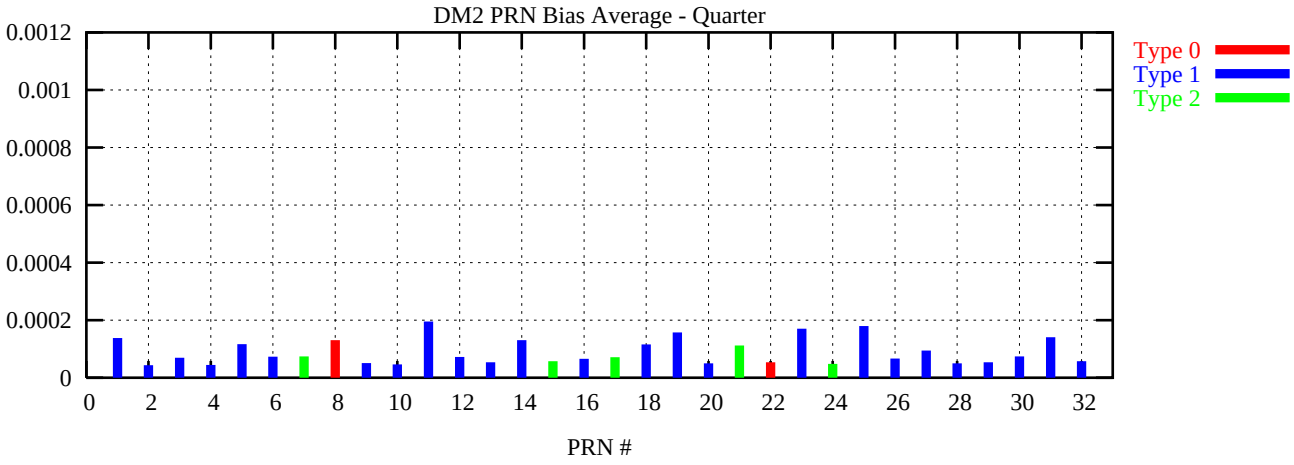
PRN	SVN	DM1	DM2	DM3	DM4
1	63	0.0002361	0.0001376	0.0000863	0.0001003
2	61	0.0002328	0.0000433	0.0000286	0.0001004
3	33	0.0001801	0.0000694	0.0001063	0.0003400
4	34	0.0001718	0.0000442	0.0000586	0.0001223
5	50	0.0001233	0.0001171	0.0000600	0.0001064
6	36	0.0002020	0.0000730	0.0000636	0.0001116
7	34	0.0001215	0.0000742	0.0000317	0.0001285
8	38	0.0001495	0.0001310	0.0000452	0.0001106
9	39	0.0001562	0.0000506	0.0000658	0.0001022
10	40	0.0007070	0.0000464	0.0002743	0.0001017
11	46	0.0009385	0.0001957	0.0000608	0.0002544
12	58	0.0001513	0.0000724	0.0000903	0.0000791
13	43	0.0005765	0.0000540	0.0000756	0.0001617
14	41	0.0007029	0.0001304	0.0001147	0.0001340
15	55	0.0001344	0.0000575	0.0000261	0.0001433
16	56	0.0001395	0.0000656	0.0001227	0.0003300
17	53	0.0001469	0.0000715	0.0000417	0.0001274
18	54	0.0006621	0.0001156	0.0000443	0.0002309
19	59	0.0004327	0.0001572	0.0000441	0.0000880
20	51	0.0001287	0.0000499	0.0000354	0.0001578
21	45	0.0003461	0.0001121	0.0001642	0.0001206
22	47	0.0003768	0.0000536	0.0000900	0.0003498
23	60	0.0010279	0.0001700	0.0000399	0.0004314
24	65	0.0002211	0.0000482	0.0000384	0.0001070
25	62	0.0002973	0.0001797	0.0000804	0.0001124
26	26	0.0002309	0.0000670	0.0001395	0.0000950
27	27	0.0003754	0.0000941	0.0000590	0.0003014
28	44	0.0002710	0.0000497	0.0000355	0.0000921
29	57	0.0002819	0.0000541	0.0000939	0.0003067
30	30	0.0004269	0.0000743	0.0001451	0.0001217
31	52	0.0003828	0.0001406	0.0000372	0.0002389
32	23	0.0001876	0.0000570	0.0000994	0.0000892

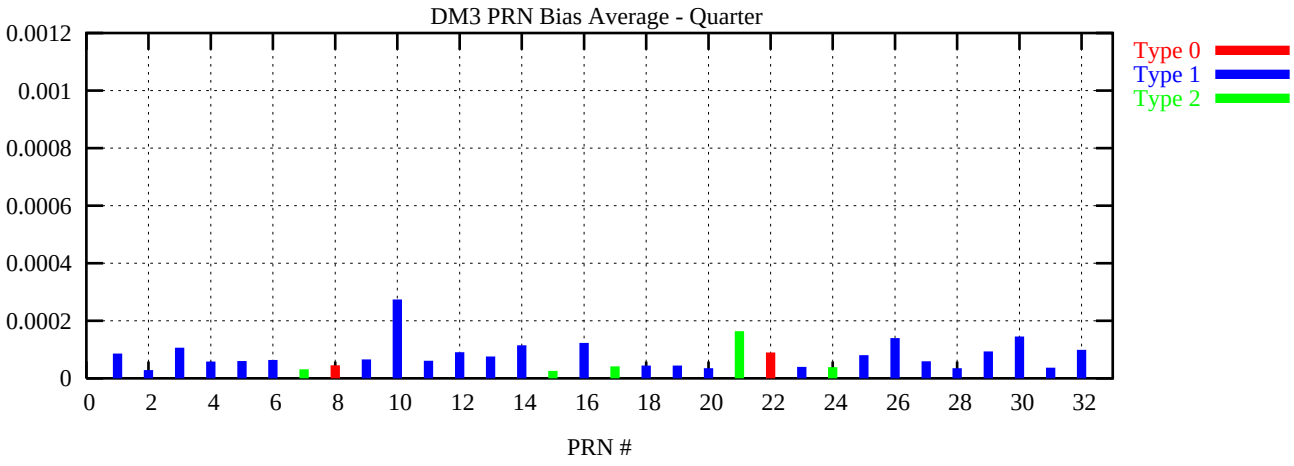
Table 11-5 PRN Bias Average Since January 1, 2008

PRN	SVN	DM1	DM2	DM3	DM4
1	32	0.00022073	0.00012850	0.00008438	0.00009720
2	61	0.00020187	0.00005315	0.00002575	0.00009521
3	33	0.00020797	0.00006061	0.00009459	0.00035133
4	34	0.00021548	0.00004470	0.00006872	0.00012816
5	35	0.0004283	0.0000655	0.0001190	0.0001572
5	50	0.00013769	0.00012623	0.00006059	0.00010167
6	36	0.00016379	0.00005934	0.00005044	0.00012529
7	34	0.00012927	0.00008613	0.00003461	0.00012489
8	38	0.00016187	0.00012890	0.00004380	0.00010193
9	39	0.00020133	0.00005265	0.00006690	0.00010863
10	40	0.00068532	0.00006022	0.00027108	0.00009762
11	46	0.00091298	0.00018563	0.00005731	0.00024475
12	58	0.00020102	0.00008319	0.00009983	0.00007955
13	43	0.00053268	0.00005437	0.00006594	0.00015982
14	41	0.00066341	0.00012066	0.00011419	0.00012743
15	55	0.00012679	0.00006575	0.00002786	0.00013721
16	56	0.00015655	0.00007231	0.00011360	0.00033857
17	53	0.00015056	0.00007385	0.00003893	0.00012883
18	54	0.00063113	0.00010638	0.00004285	0.00021984
19	59	0.00039797	0.00014065	0.00003818	0.00008556
20	51	0.00014780	0.00004777	0.00003827	0.00013979
21	45	0.00054763	0.00016570	0.00019175	0.00009665
22	47	0.00025287	0.00007706	0.00009590	0.00020817
23	60	0.00098117	0.00015085	0.00003645	0.00042798
24	24	0.0002973	0.0000492	0.0000356	0.0001077
24	65	0.00022094	0.00004819	0.00003841	0.00010687
25	25	0.00034880	0.00021696	0.00007148	0.00012067
25	62	0.00025783	0.00008337	0.00014791	0.00009177
26	26	0.00046717	0.00008512	0.00006260	0.00032949
27	27	0.00025519	0.00005275	0.00003397	0.00009249
28	44	0.00024288	0.00006346	0.00010194	0.00029383
29	57	0.00032405	0.00008675	0.00005815	0.00011675
30	30	0.00043891	0.00015295	0.00003838	0.00025025
31	52	0.00025376	0.00005130	0.00010568	0.00009449
32	23	0.00034880	0.00021696	0.00007148	0.00012067

Figure 11-2 PRN Bias Average for the Quarter







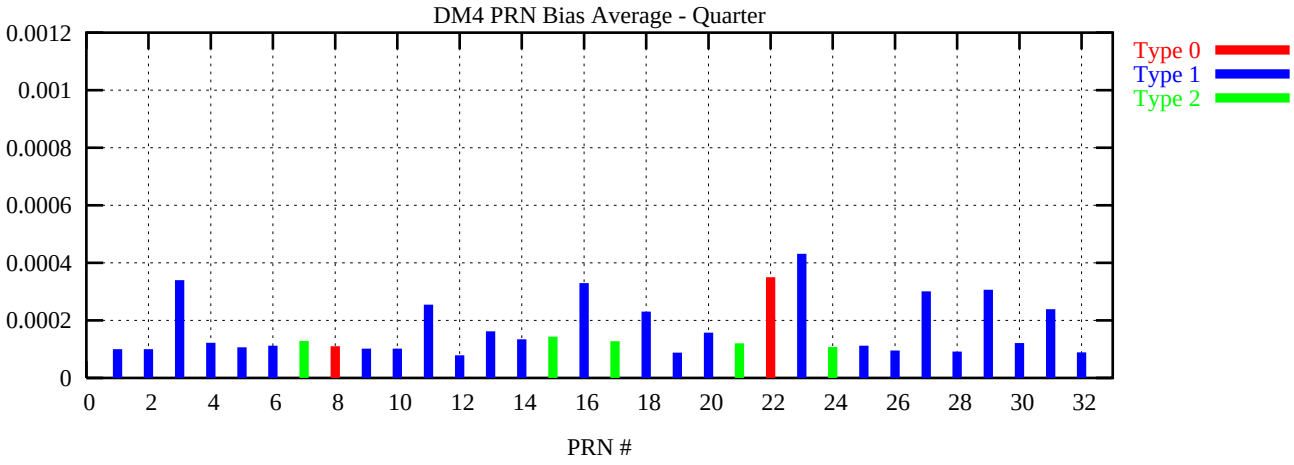


Figure 11-3 PRN Bias Average Trend (PRN 1 - PRN 4)

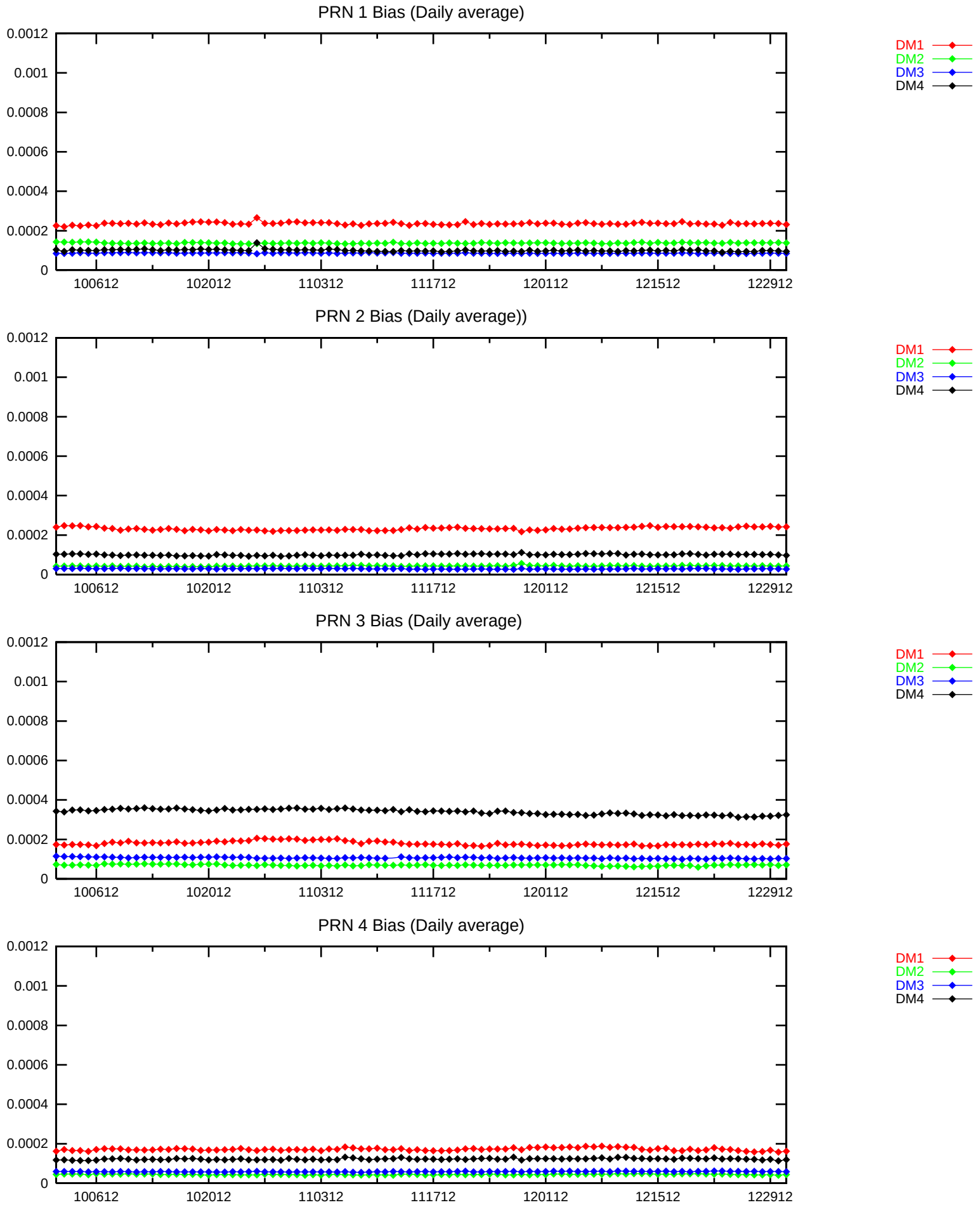


Figure 11-4 PRN Bias Average Trend (PRN 5 - PRN 8)

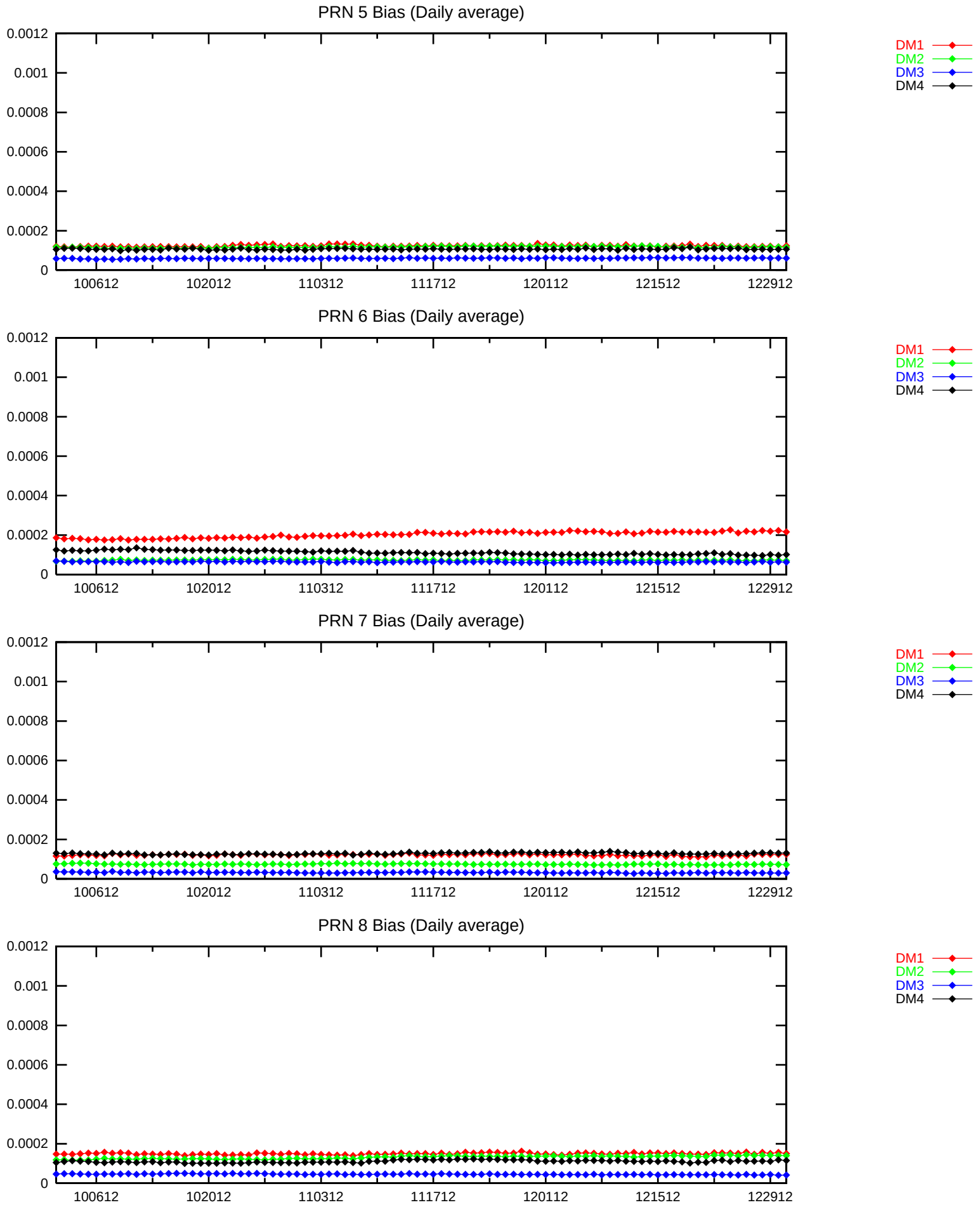


Figure 11-5 PRN Bias Average Trend (PRN 9 - PRN 12)

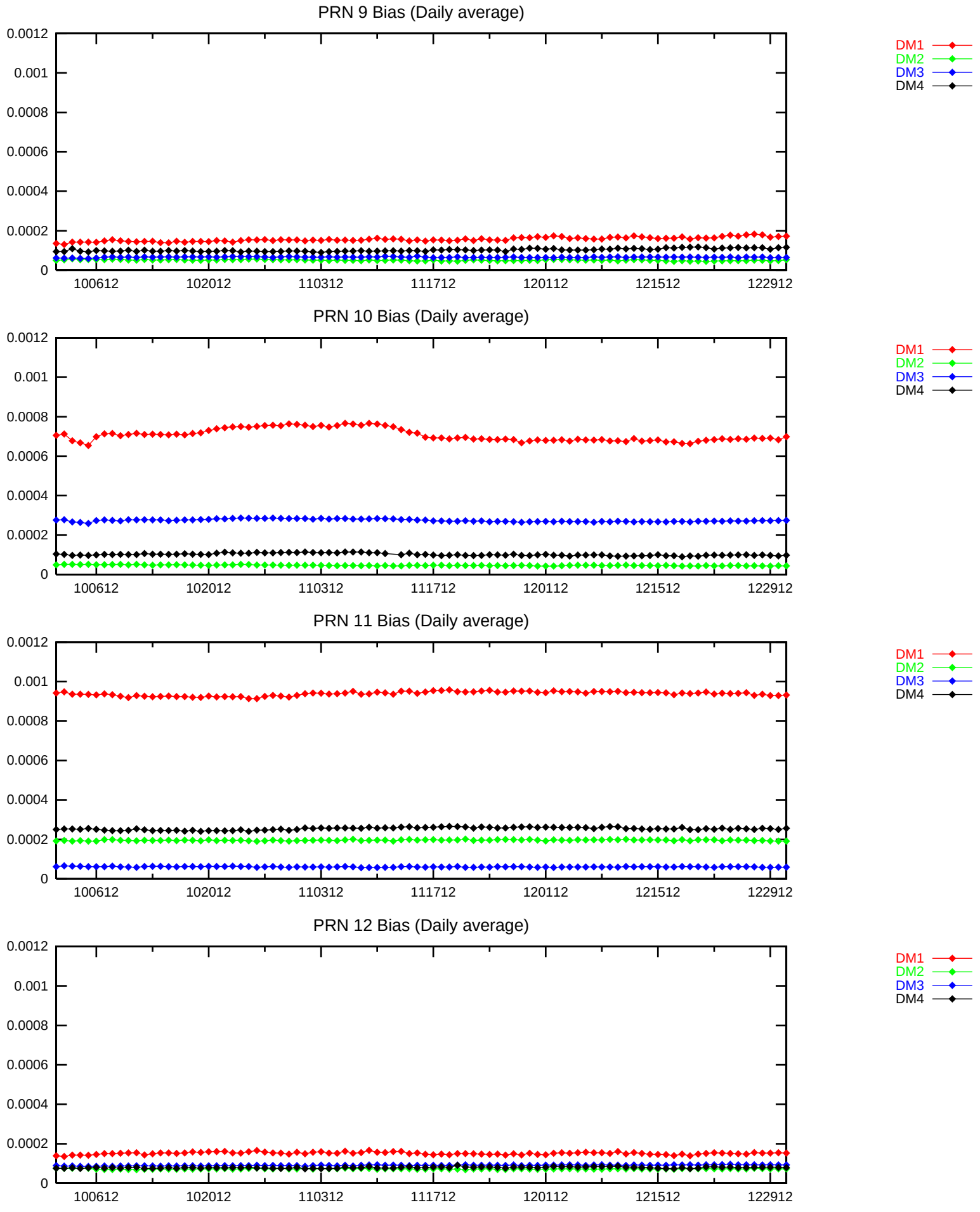


Figure 11-6 PRN Bias Average Trend (PRN 13 - PRN 16)

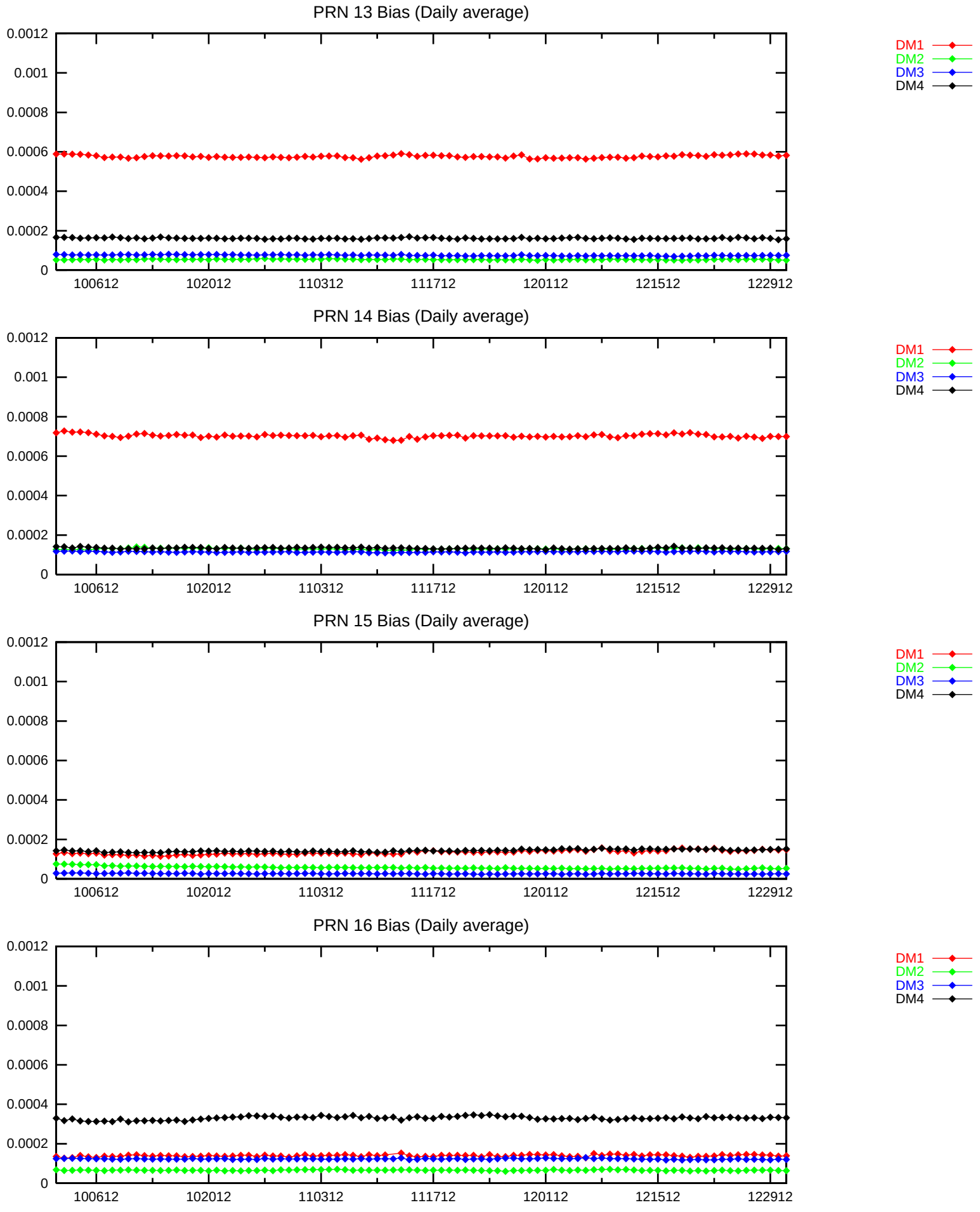


Figure 11-7 PRN Bias Average Trend (PRN 17 - PRN 20)

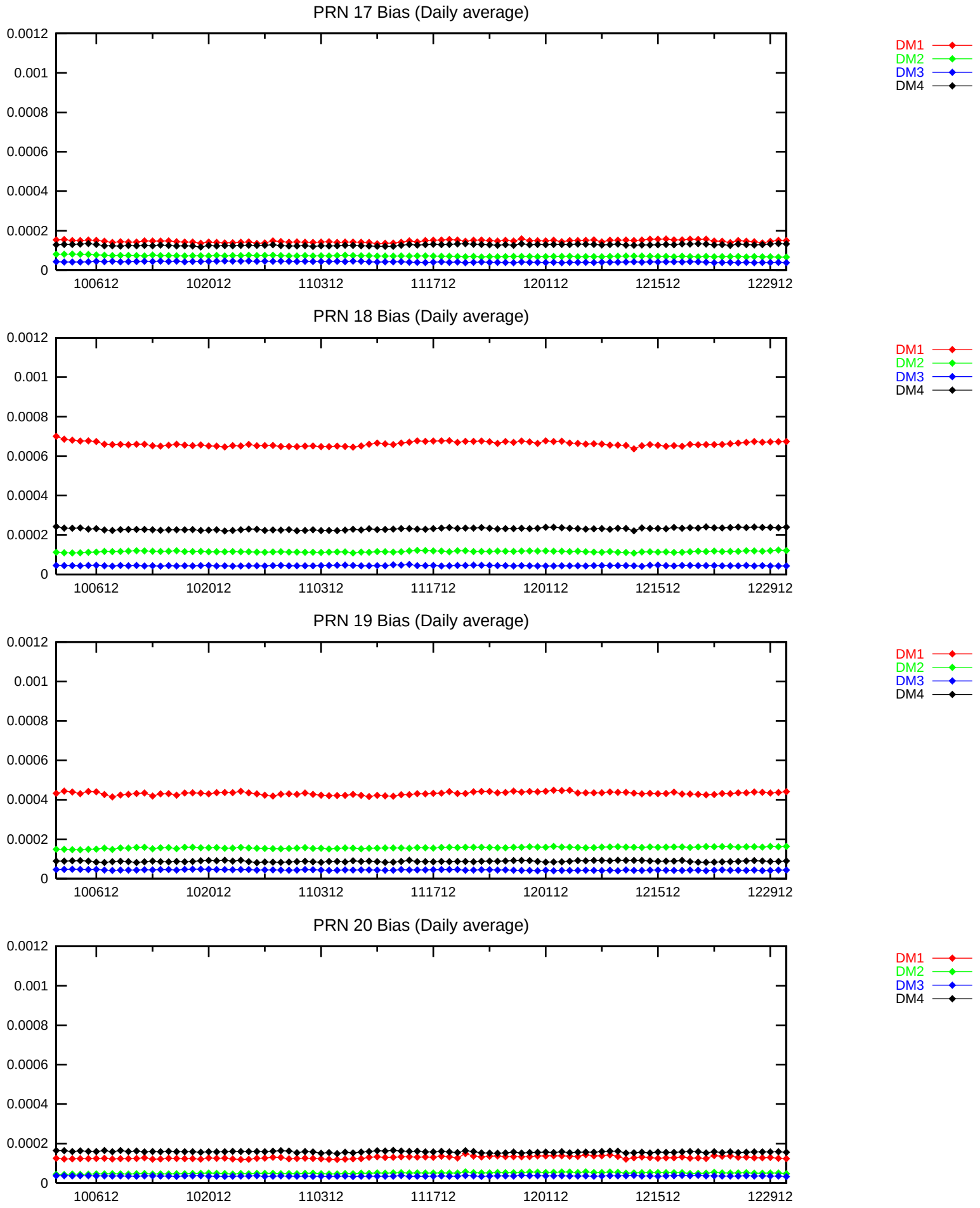


Figure 11-8 PRN Bias Average Trend (PRN 21 - PRN 24)

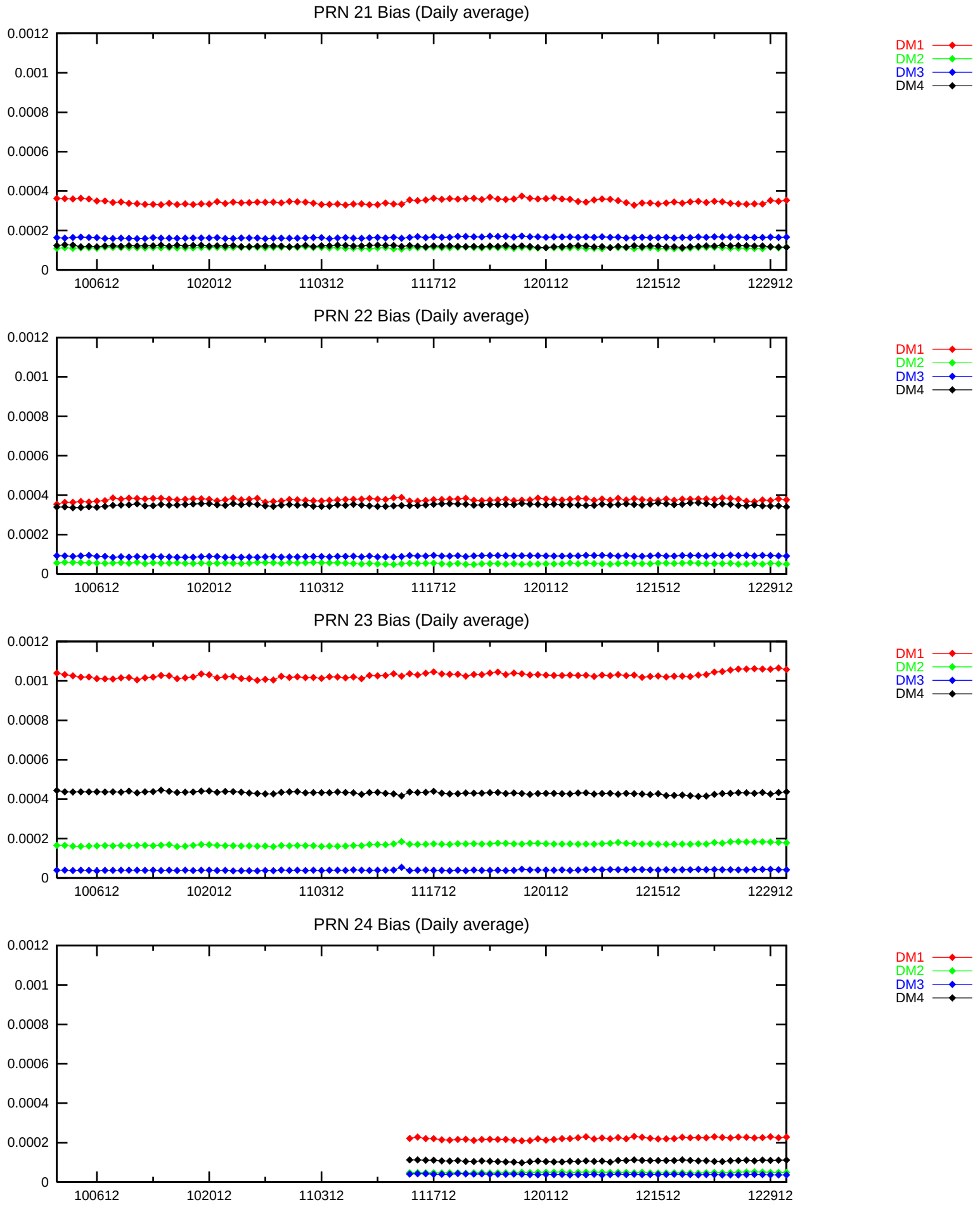


Figure 11-9 PRN Bias Average Trend (PRN 25 - PRN 28)

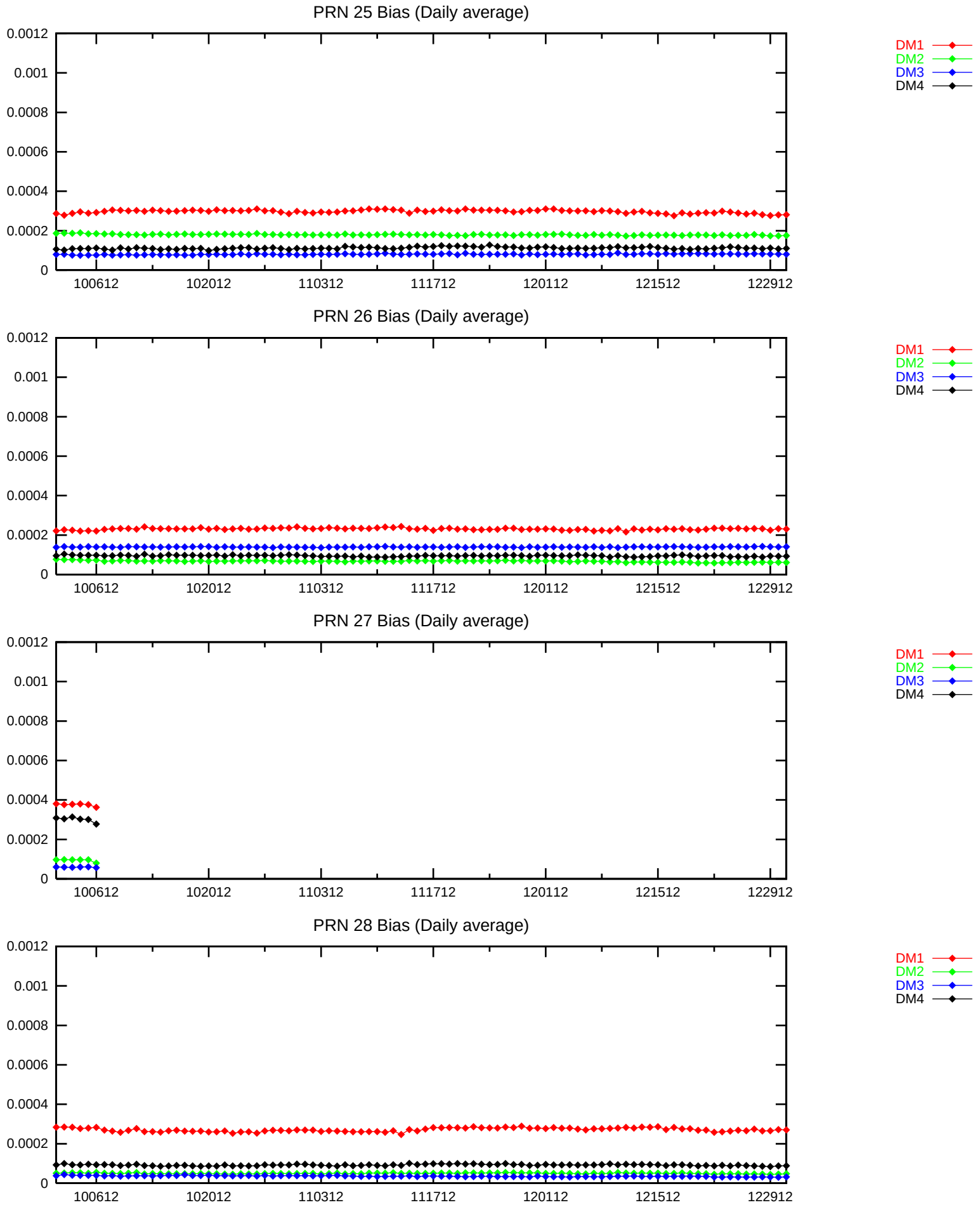
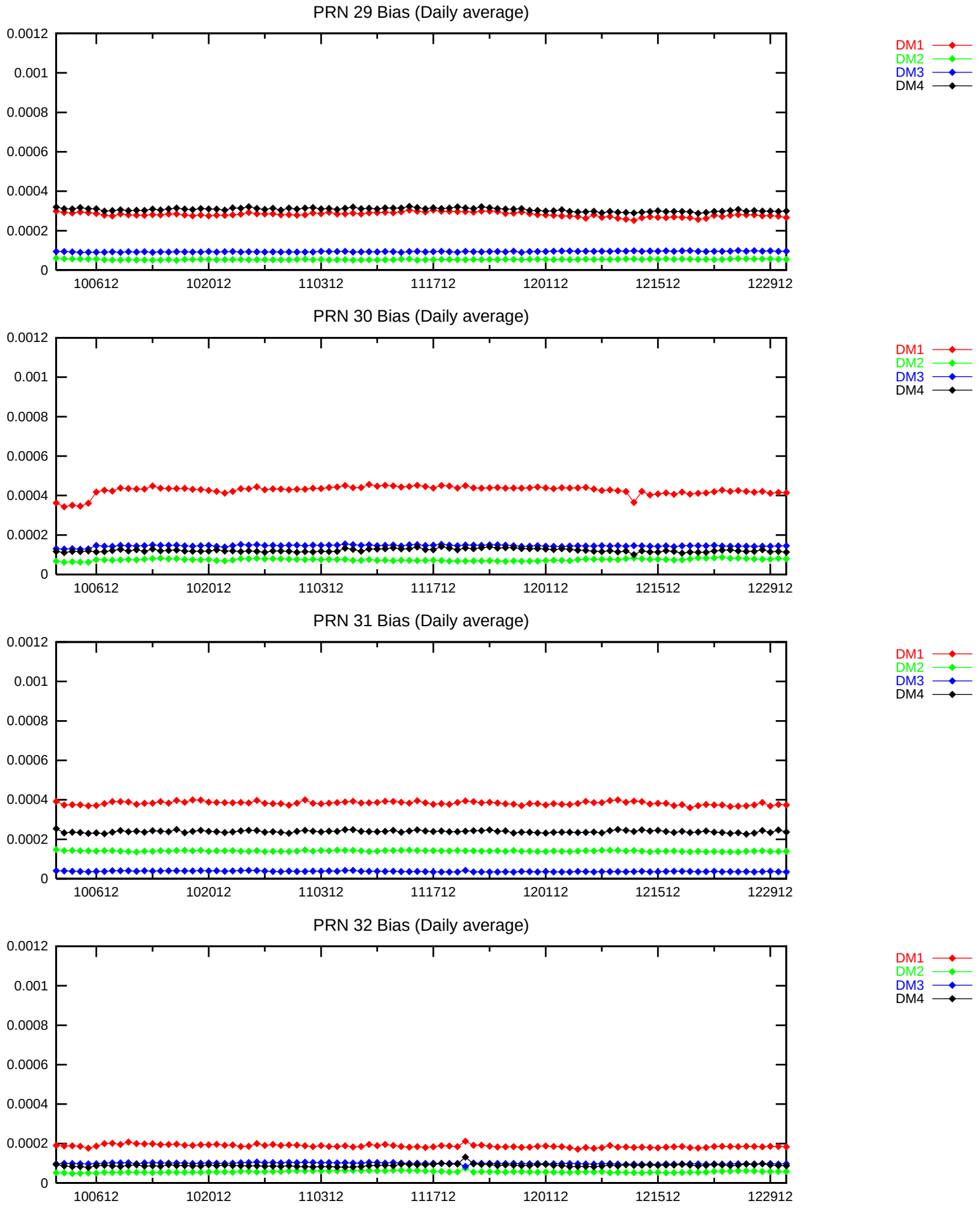


Figure 11-10 PRN Bias Average Trend (PRN 29 - PRN 32)



11.4 SQM Trips

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

12.0 GPS BROADCAST ORBIT VS. NGA PRECIS ORBITS 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. Only data points where GPS is healthy and valid precise data is available are considered. Figure 12-3 shows the availability of data. There were no points where GPS was healthy and the NGA data was missing.

One year of data from 1/1/12 to 12/31/12 is presented. There was a large orbit error on PRN-19 on 6/17/12; plots with and without that error are presented. Figure 12-1a is a plot of the standard deviations without the 6/17/12 event. Figure 12-1b is a plot of the standard deviations without the 6/17/12 event. Figure 12-2a is a plot of the error means without the 6/17/12 event and Figure 12-2b is a plot with the event. The worst case standard deviations without the event meet the criteria, and therefore the assumption is validated. The PRN-19 event falls within the expected a priori rate of GPS constellation integrity failures.

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 maximum 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. Several such errors were points towards the end of the allowable fit interval where a fresher ephemeris had been broadcast, but was not in the IGS data set. This was usually due to an insufficient number of receivers viewing the satellite to meet the voting validation threshold. These missing

ephemeris updates were manually added to the data set and the data was reprocessed. Some of the remaining 2 times URA level outliers may also be the result of this same issue. However, the 6/12/12 PRN-31 outliers are not from stale ephemeris data. WAAS Honolulu (HNL) data was added to fill in the missing data for that event. Review of the HNL data revealed an unusual data set update sequence coincident with the 6/12/12 event. See Table 12-1.

Table 12-1 6/12/12 Event Ephemeris Update Sequence

IODC	ToT
7	04:00:06
90	06:00:06
21	06:11:06
99	08:00:06
100	09:00:06
18	11:20:06
19	12:00:06
153	12:02:06
154	14:00:06
20	14:37:36
22	16:00:06

Figures 12-45 through 12-77 are histograms of the height error, along track error, cross track error, and URA normalized range error. Figures 12-78 to 12-110 are the timelines of the URA normalized range error. Missing data points are in red and are labeled with the pertinent NANUs. The 12/4/12 NANU on PRN-32 (2012078 did not result in any missing data)

Figure 12-1a GPS Broadcast Orbit Accuracy Standard Deviations - No PRN19 6/17/12 Event

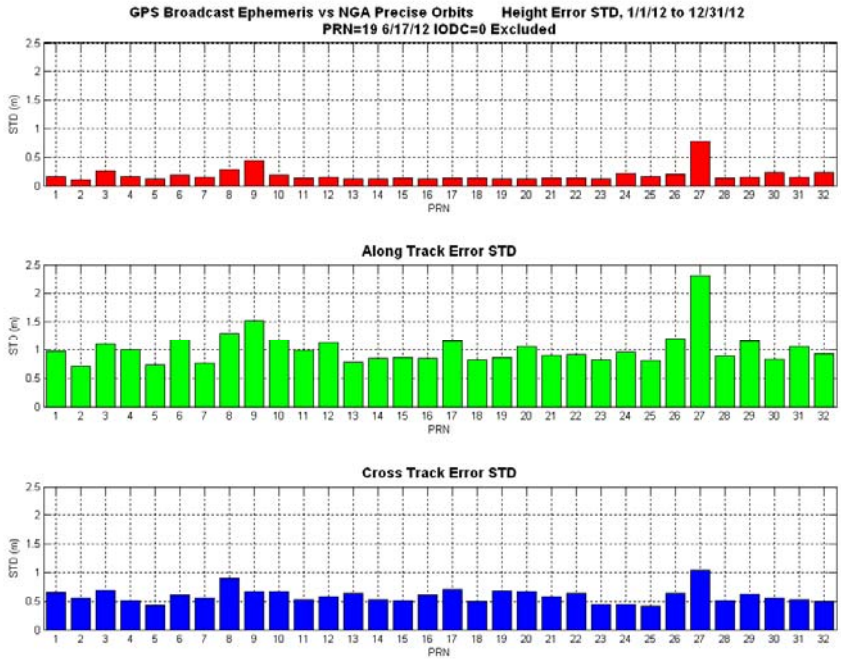


Figure 12-2b GPS Broadcast Orbit Accuracy Standard Deviations - With PRN19 6/17/12 Event

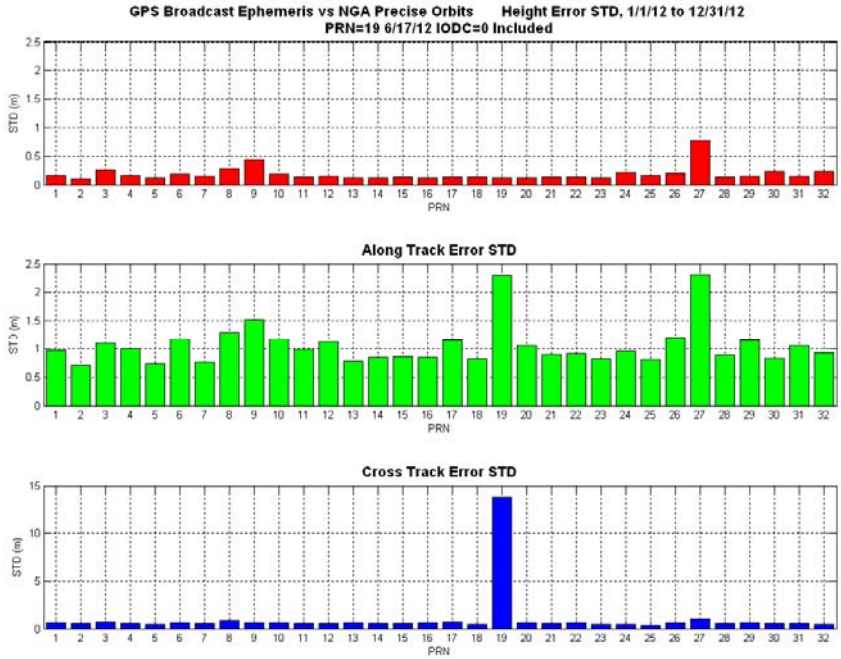


Figure 12-3a GPS Broadcast Orbit Error Means - No PRN19 6/17/12 Event

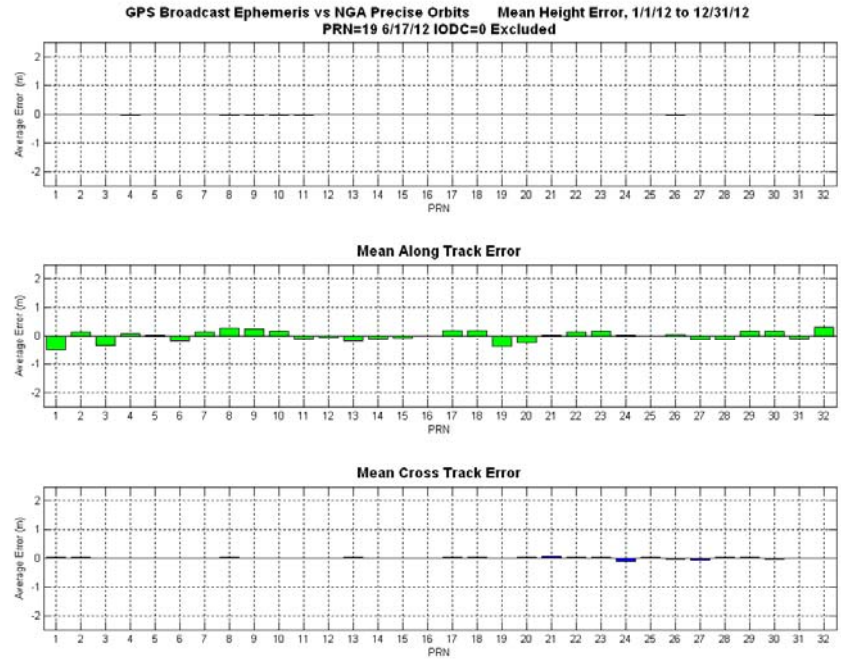


Figure 12-4bGPS Broadcast Orbit Error Means - With PRN19 6/17/12 Event

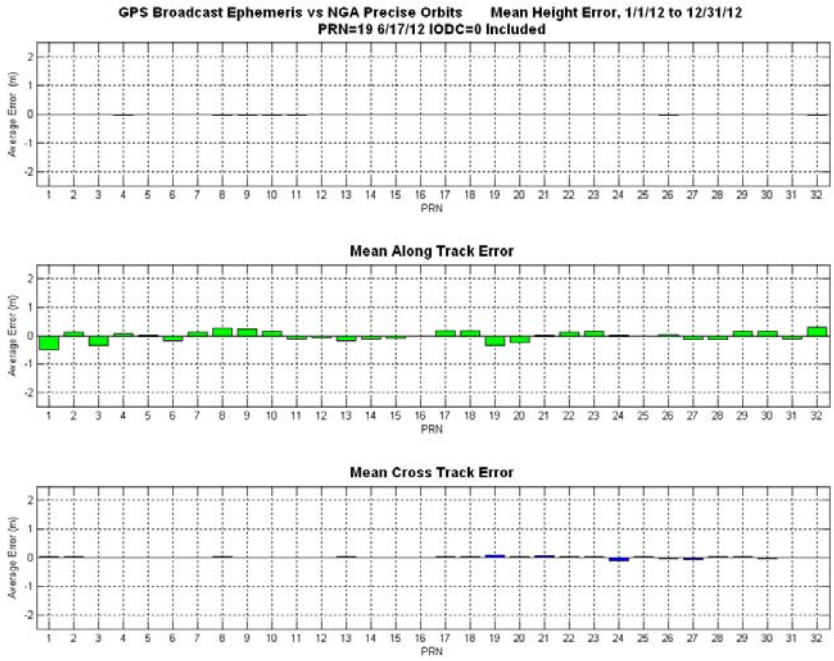


Figure 12-5 Broadcast Ephemeris vs. NGA Precise Data Availability

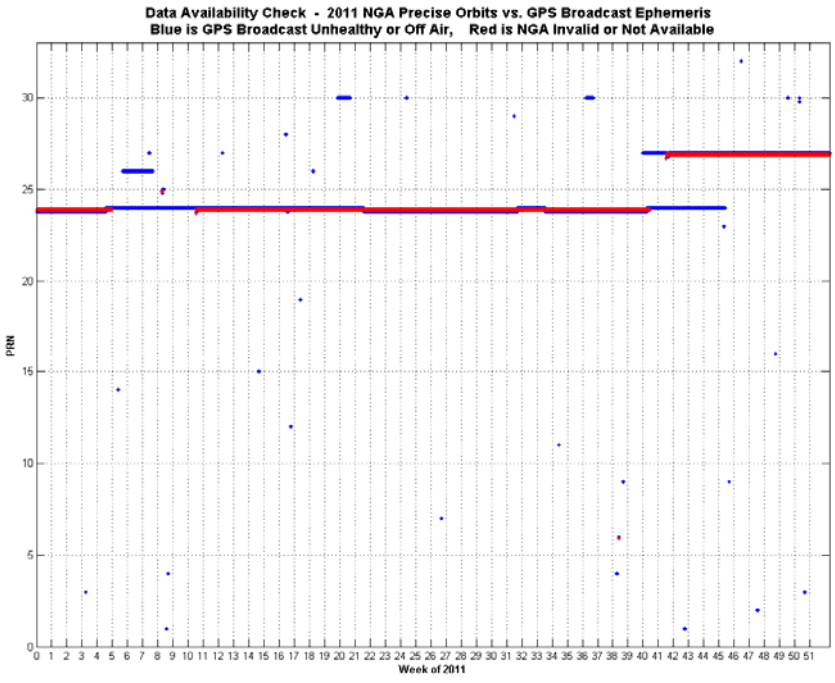


Figure 12-4 Orbit Error PRN-1 (SVN-63)

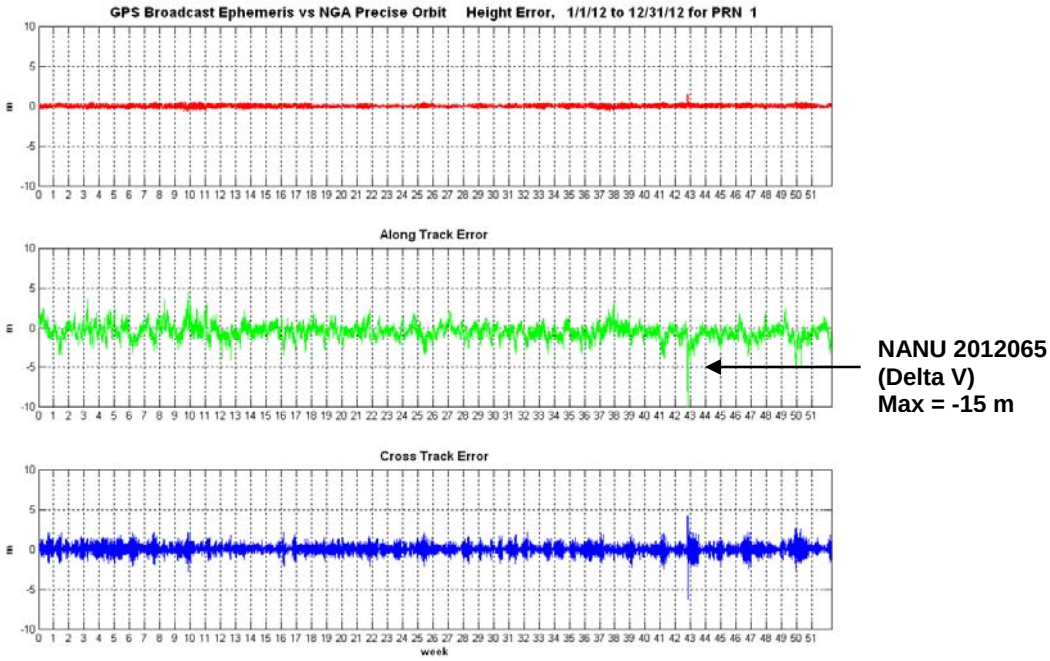


Figure 12-5 Orbit Error PRN-2 (SVN-61)

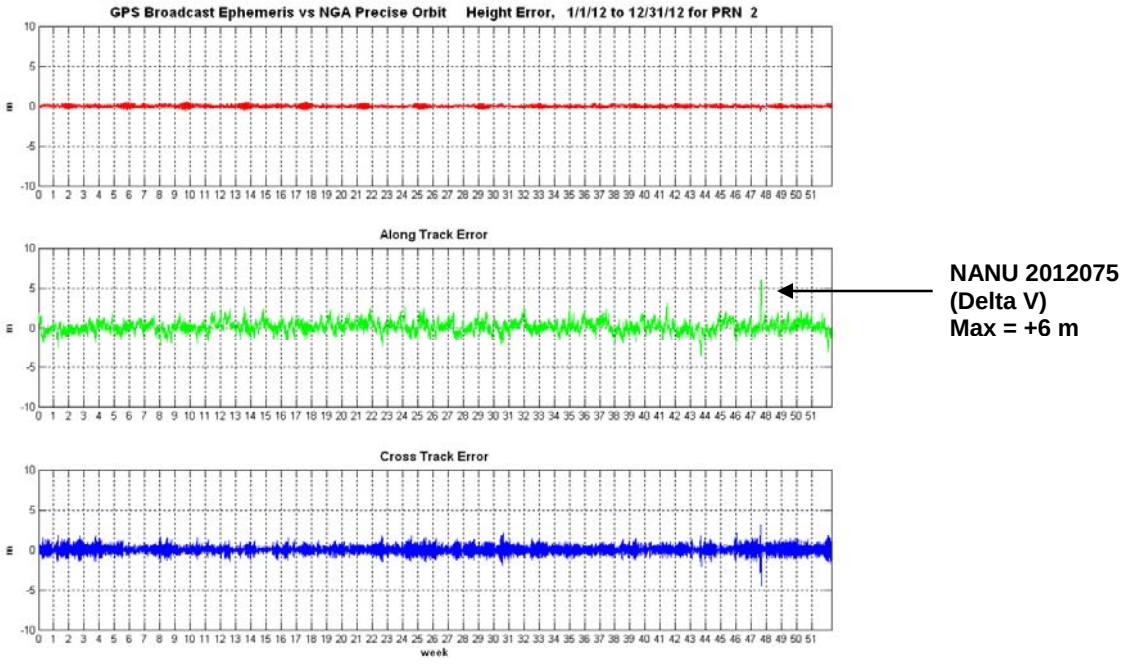


Figure 12-6 Orbit Error PRN-3 (SVN-33)

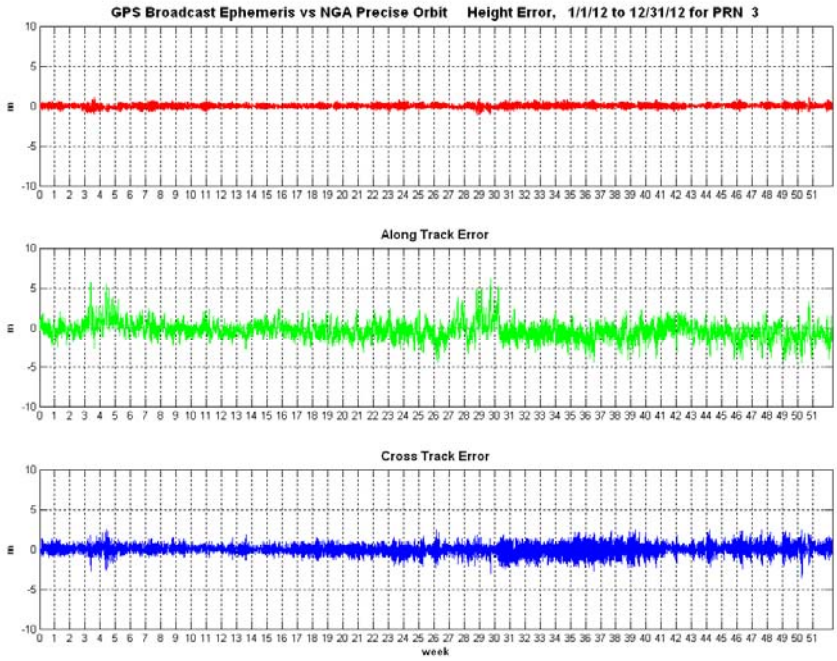
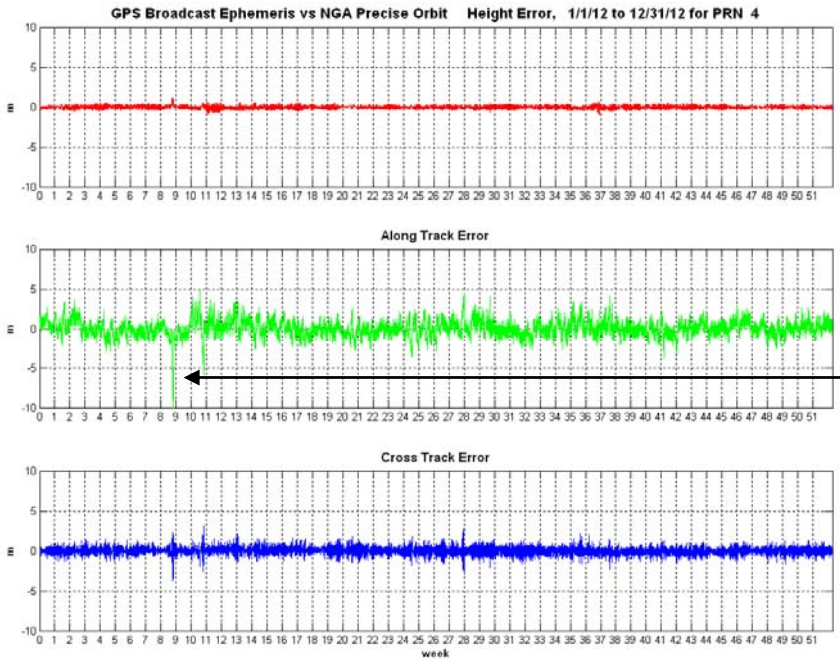


Figure 12-7 Orbit Error PRN-4 (SVN-34)



NANU 2012010
(Delta V)
Max = -12 m

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

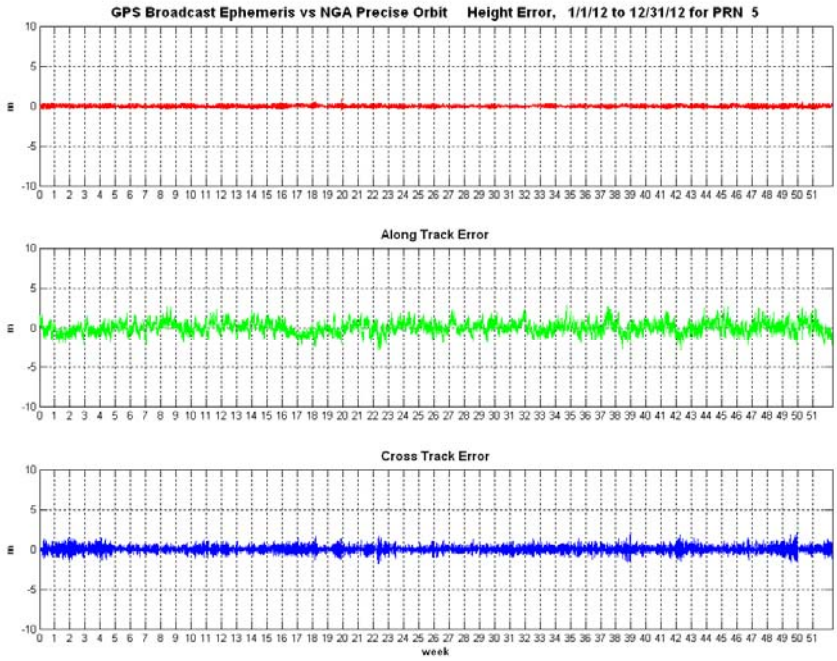


Figure 12-9 Orbit Error PRN-6 (SVN-36)

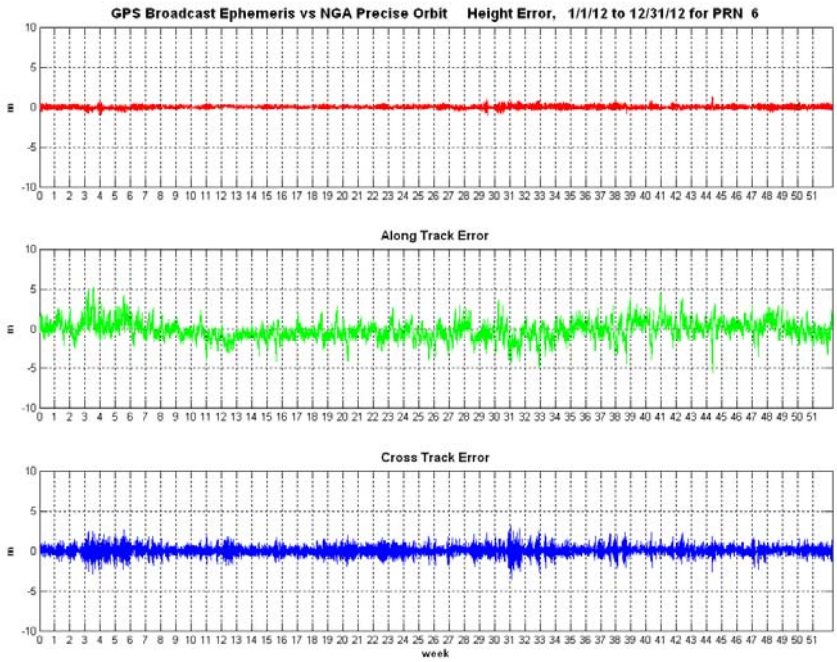


Figure 12-10 Orbit Error PRN-7 (SVN-48)

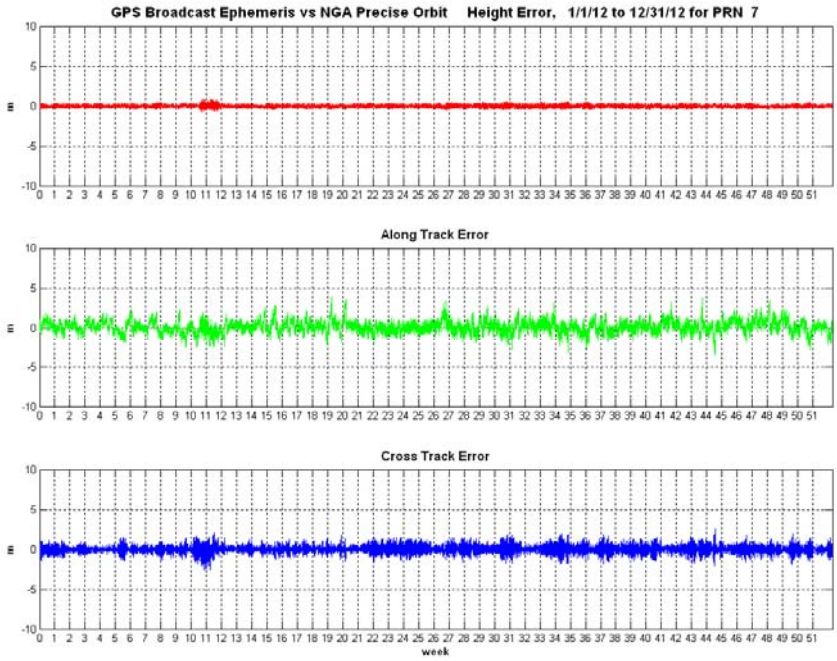


Figure 12-11 Orbit Error PRN-8 (SVN-38)

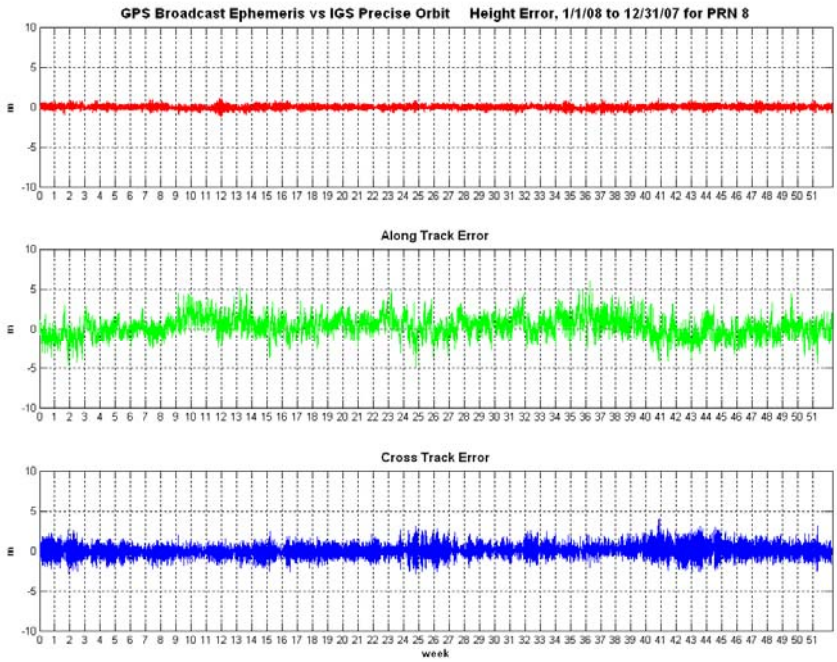


Figure 12-12 Orbit Error PRN-9 (SVN-39)

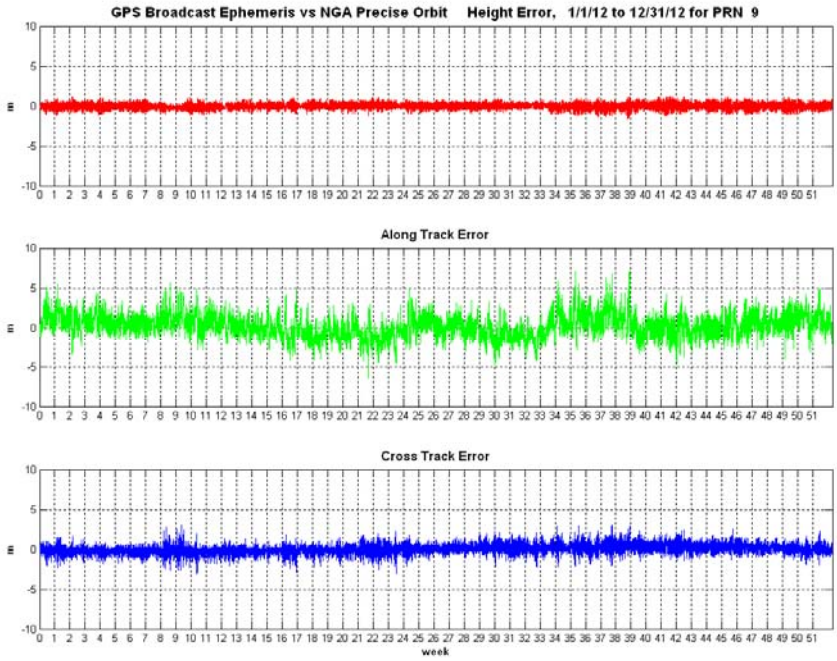


Figure 12-13 Orbit Error PRN-10 (SVN-40)

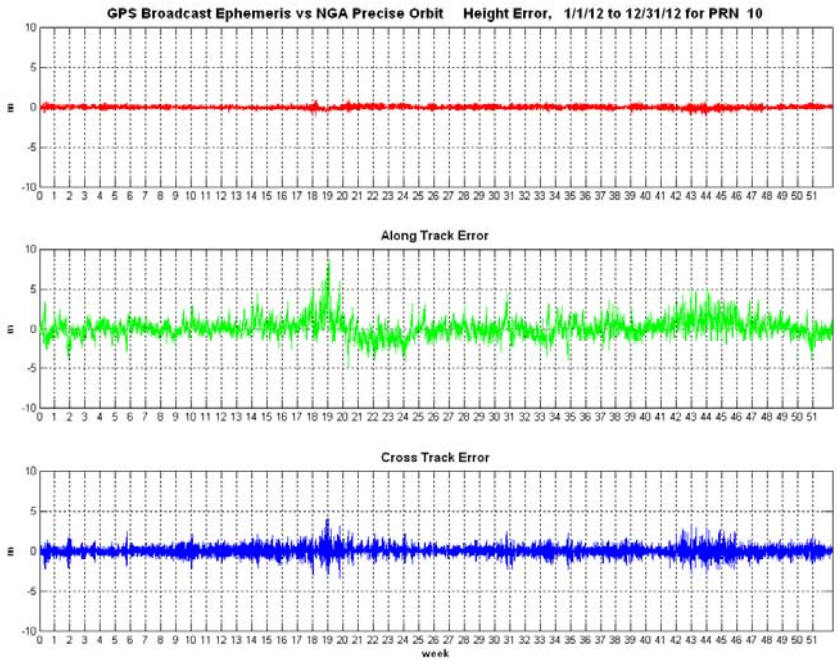


Figure 12-14 Orbit Error PRN-11 (SVN-46)

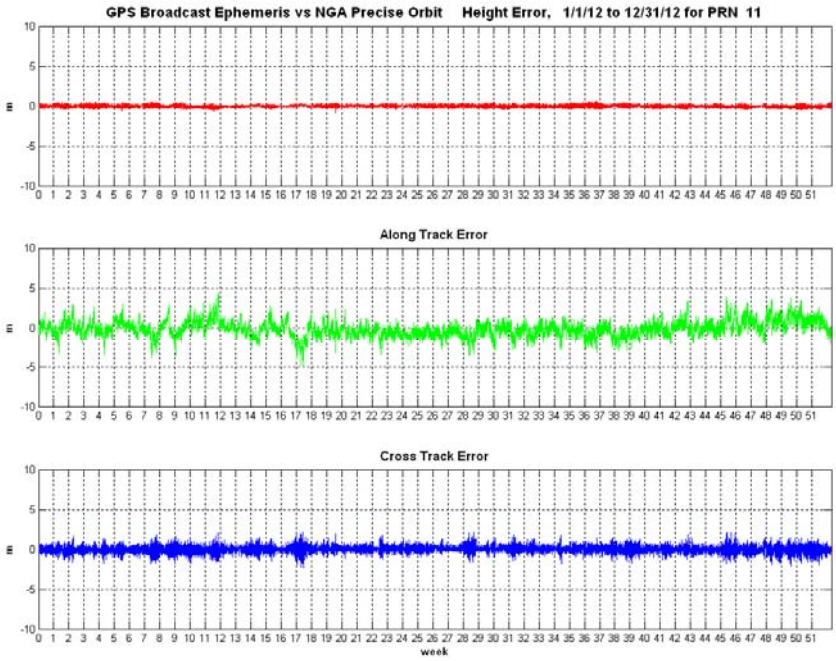
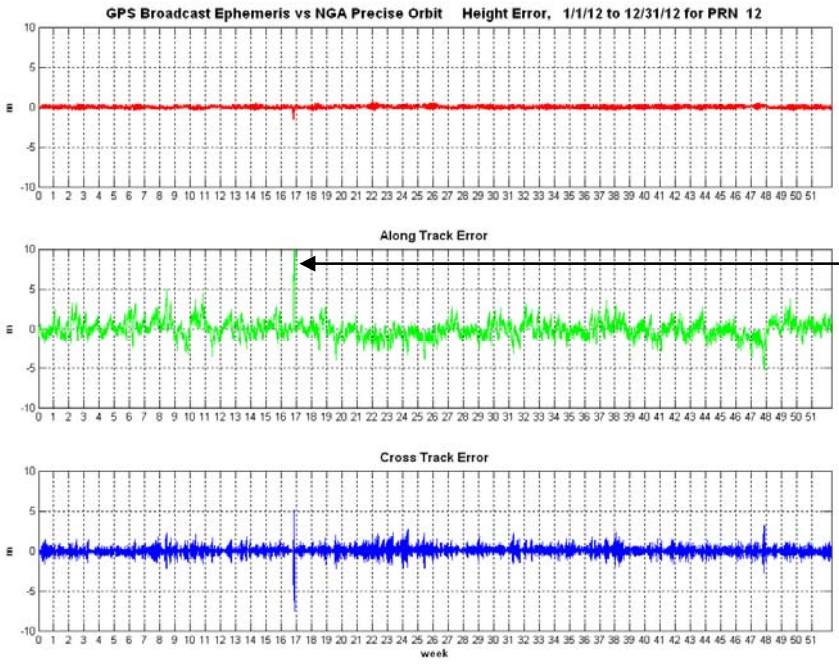


Figure 12-15 Orbit Error PRN-12 (SVN-58)



NANU 2012025 (Delta V) Max = +13.6 m

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

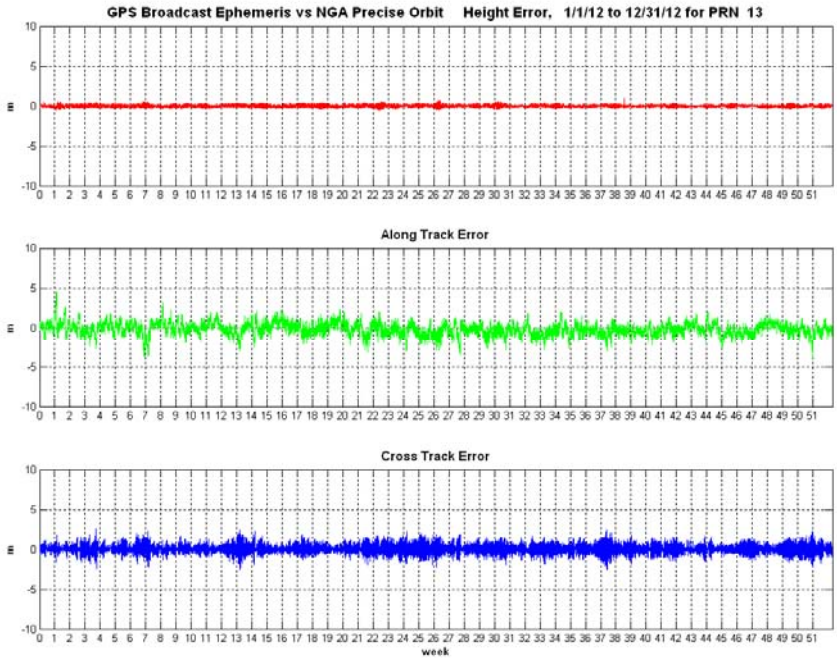


Figure 12-17 Orbit Error PRN-14 (SVN-41)

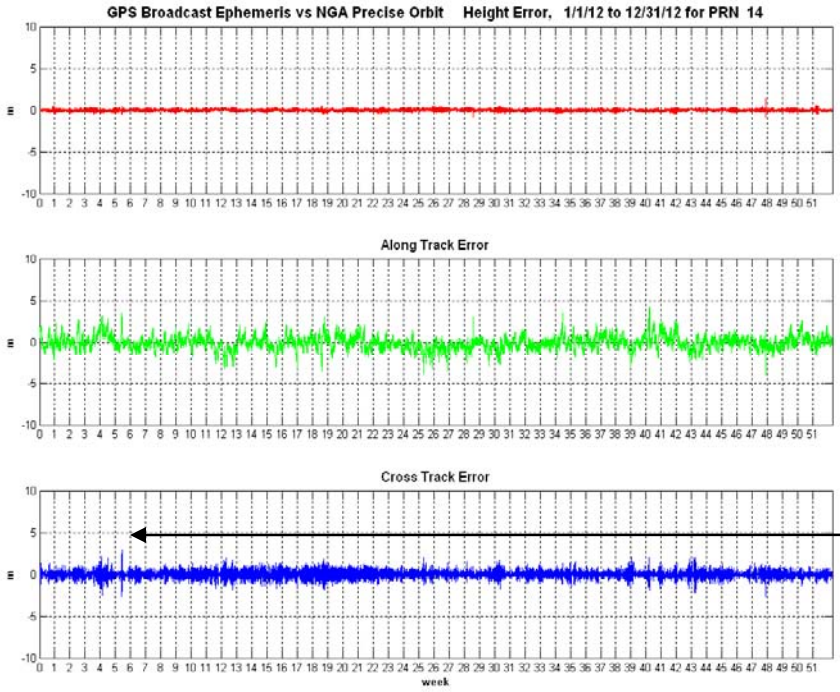


Figure 12-18 Orbit Error PRN-15 (SVN-55)

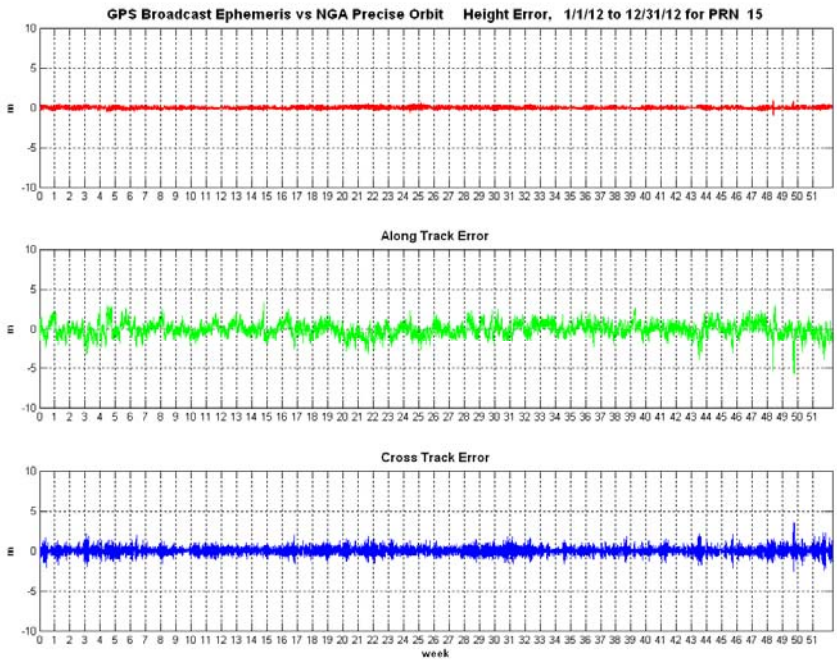


Figure 12-19 Orbit Error PRN-16 (SVN-56)

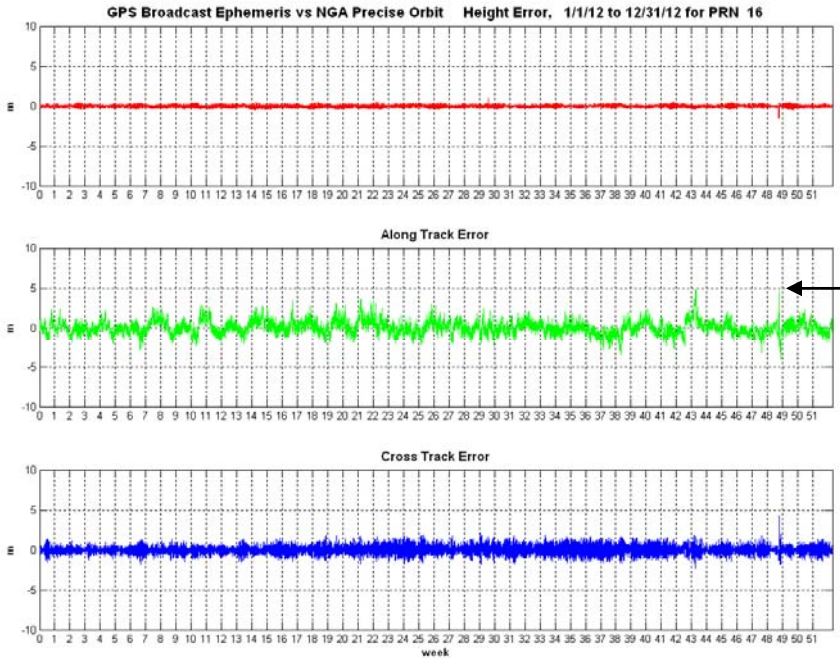


Figure 12-20 Orbit Error PRN-17 (SVN-53)

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

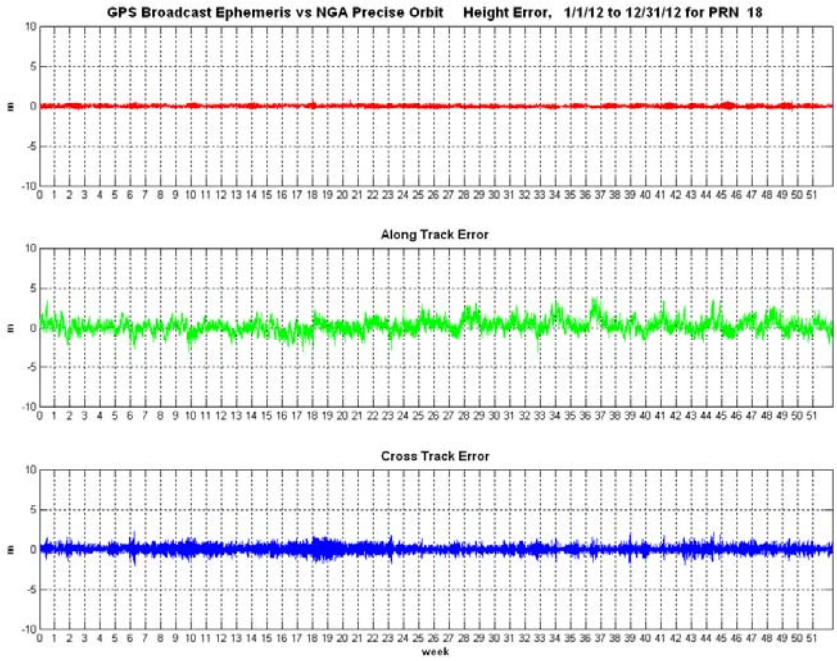
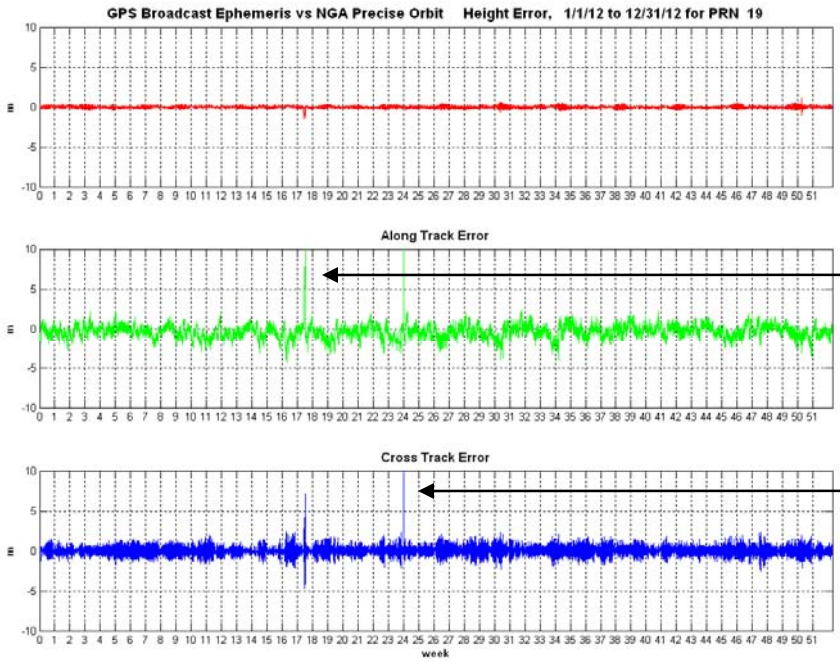


Figure 12-22 Orbit Error PRN-19 (SVN-59)



NANU 2012076
(Delta V)
max = + 11.5 m

2 points off scale
6/17/12 IODC=0
xtrk =~ 1900 m
atrk =~ 300 m

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

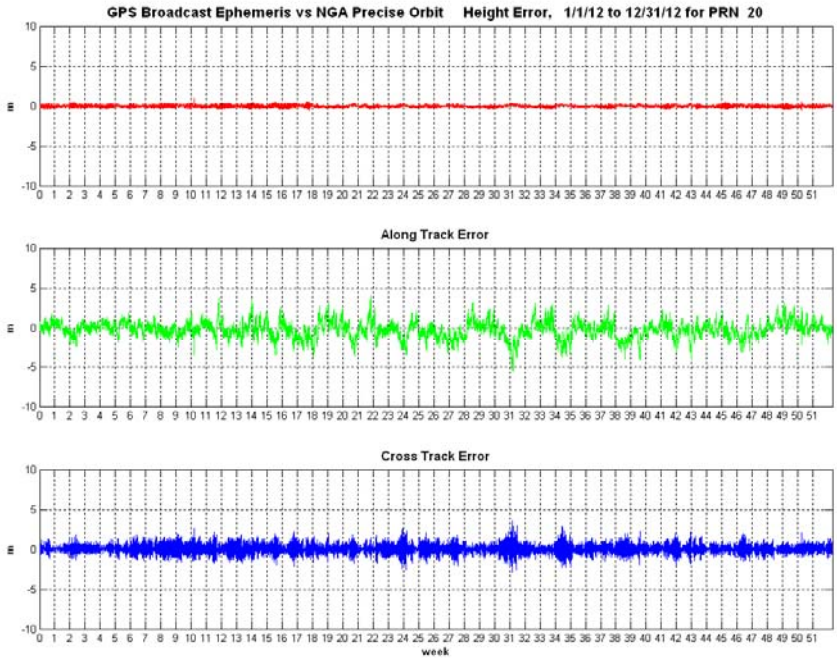


Figure 12-24 Orbit Error PRN-21 (SVN-45)

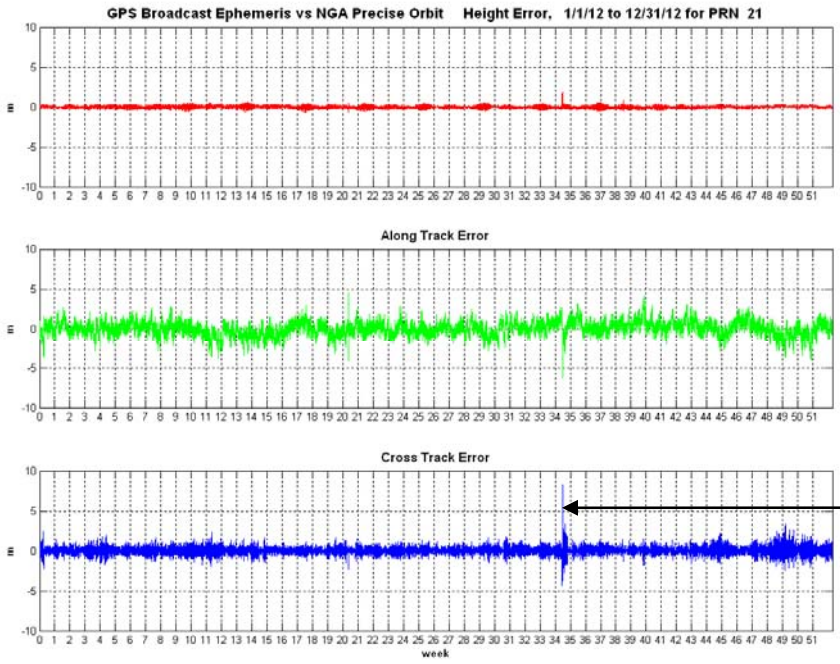


Figure 12-25 Orbit Error PRN-22 (SVN-47)

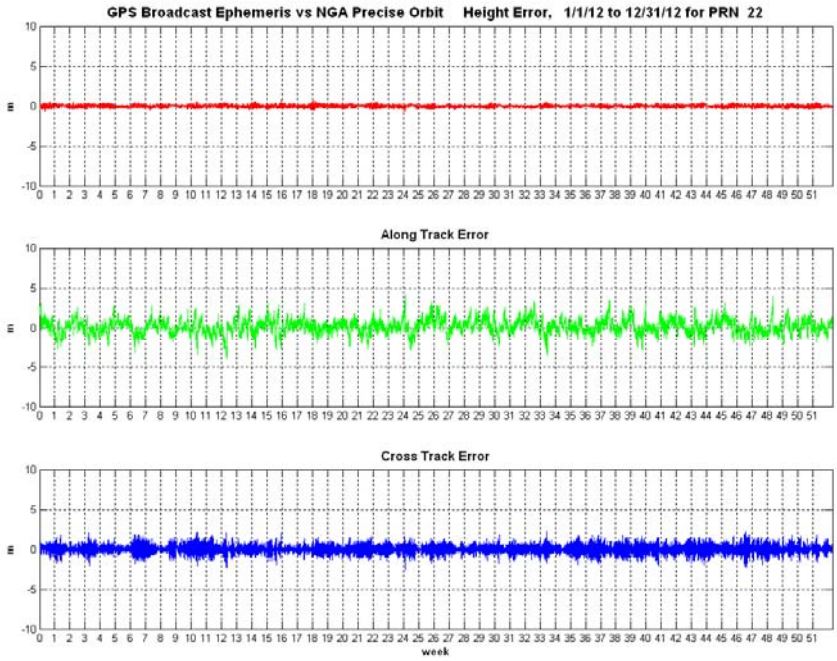


Figure 12-26 Orbit Error PRN-23 (SVN-60)

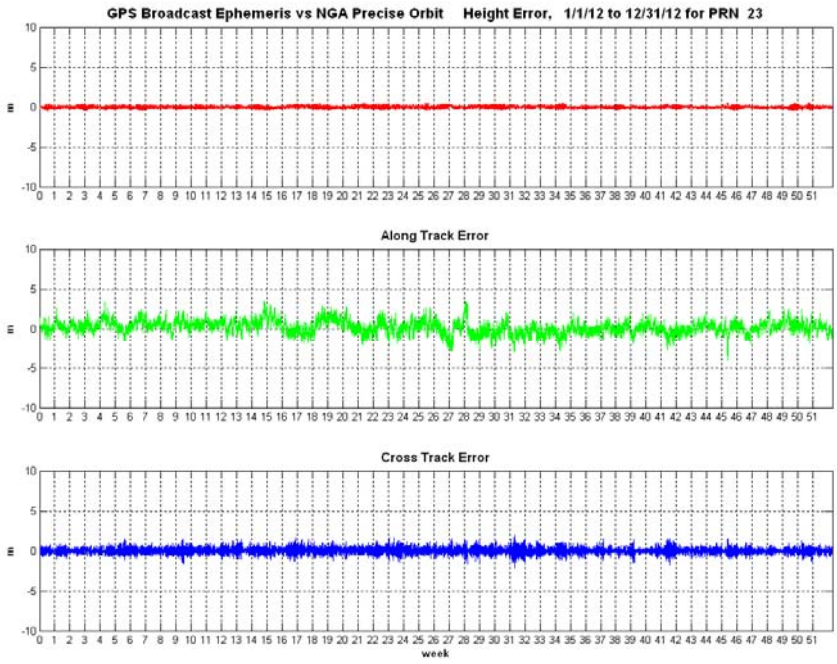


Figure 12-27 Orbit Error PRN-24 (SVN-65)

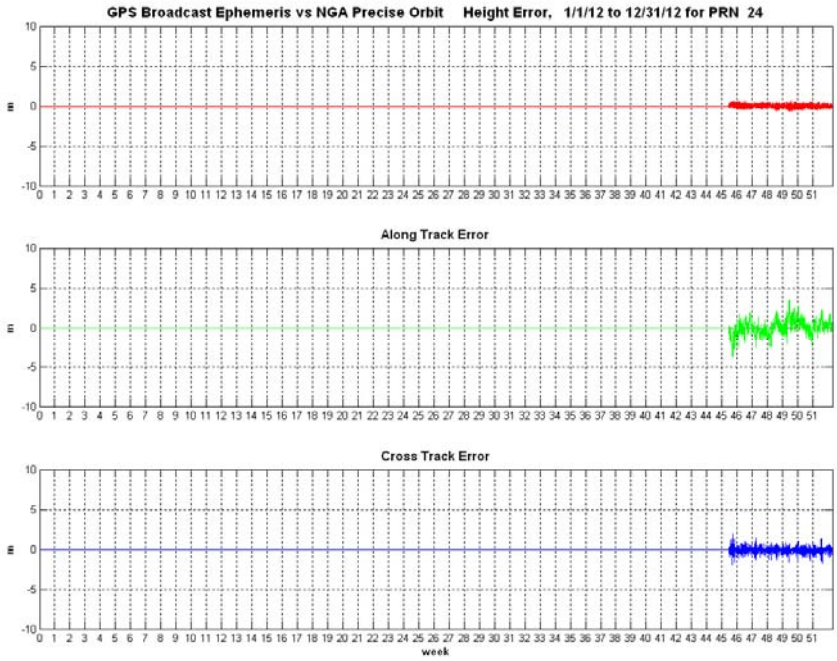


Figure 12-28 Orbit Error PRN-25 (SVN-62)

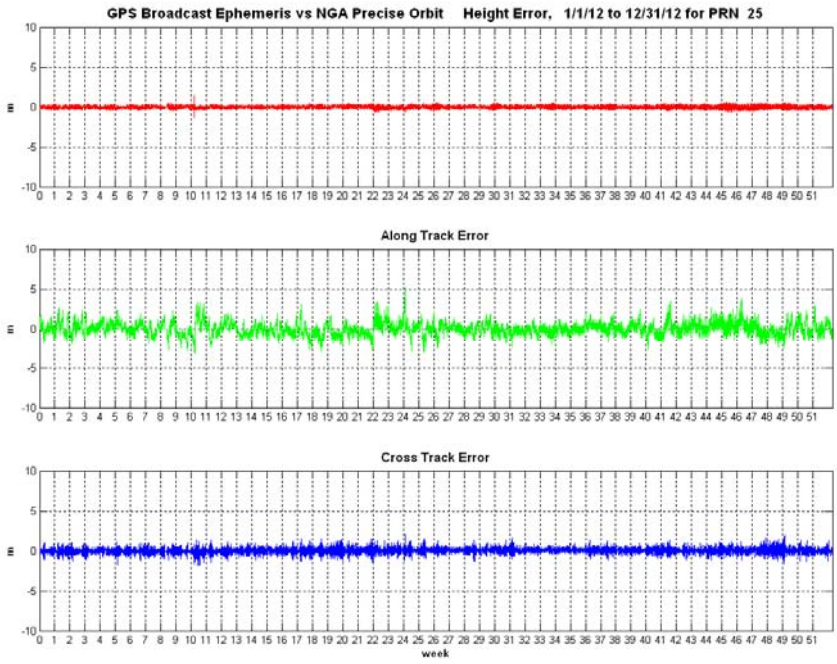


Figure 12-29 Orbit Error PRN-26 (SVN-26)

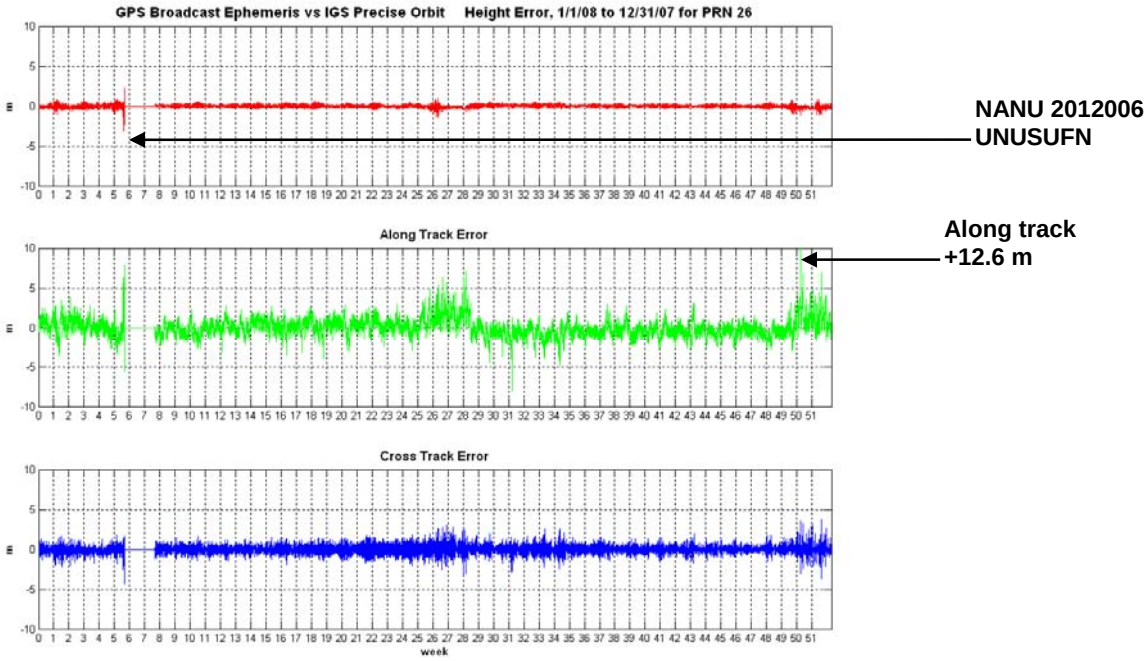


Figure 12-30 Orbit Error PRN-27 (SVN-27)

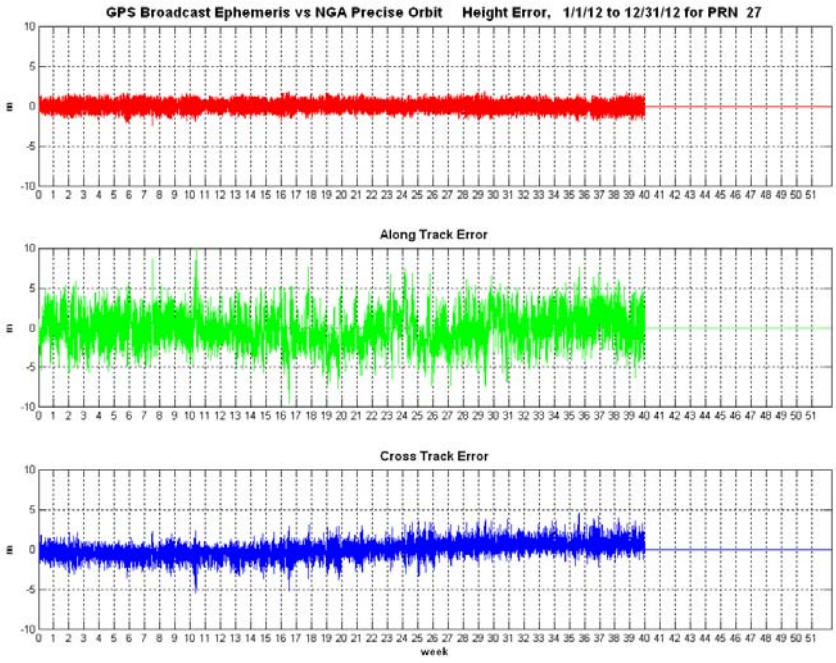


Figure 12-31 Orbit Error PRN-28 (SVN-44)

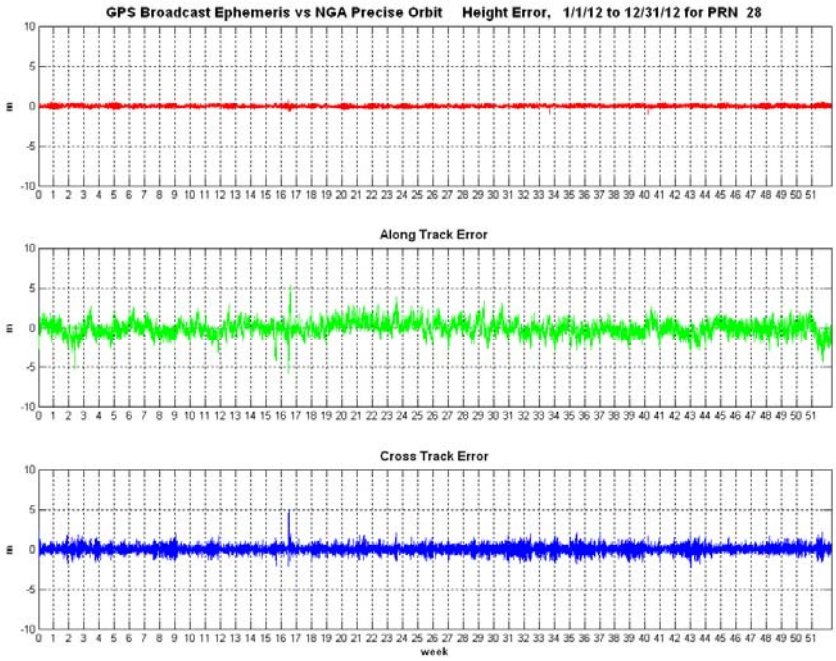


Figure 12-32 Orbit Error PRN-29 (SVN-57)

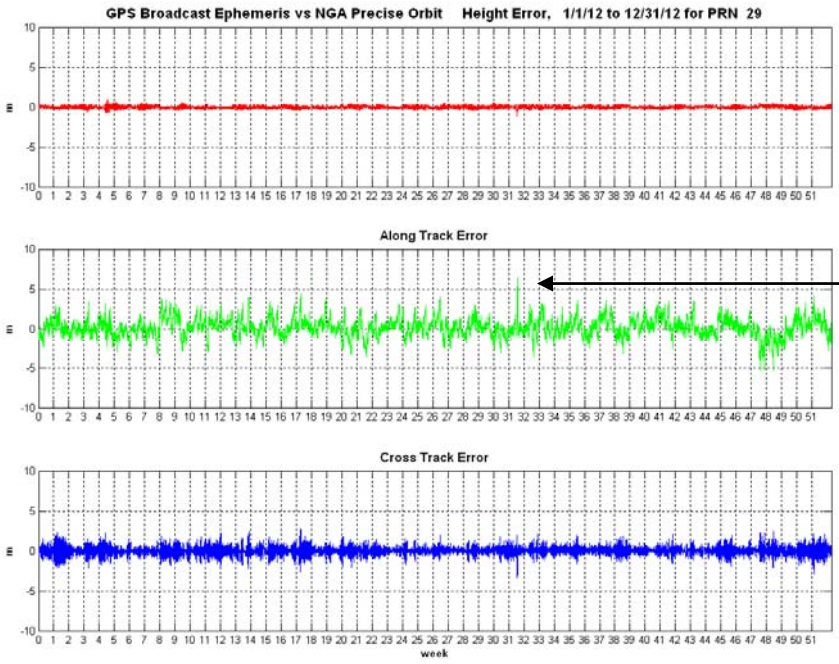


Figure 12-33 Orbit Error PRN-30 (SVN-35)

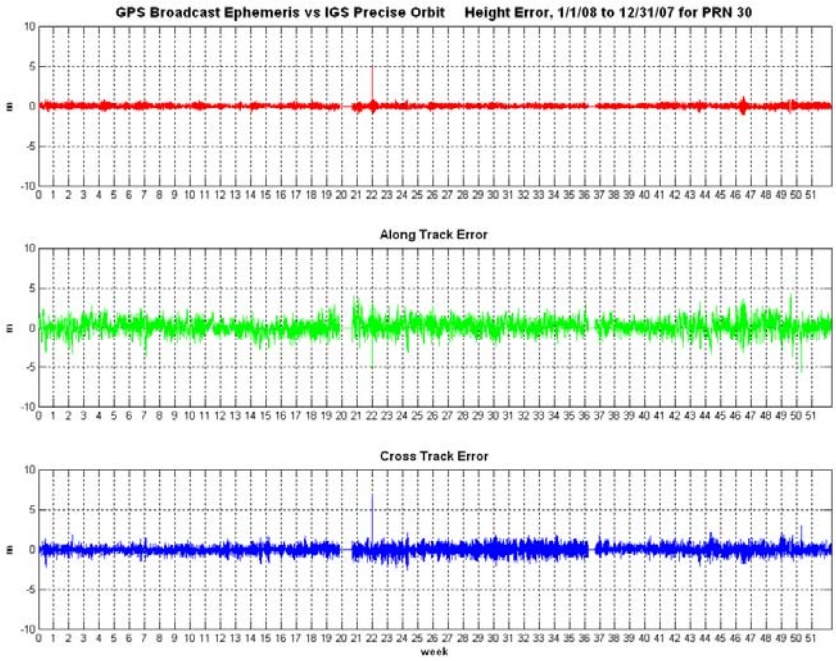


Figure 12-34 Orbit Error PRN-31 (SVN-52)

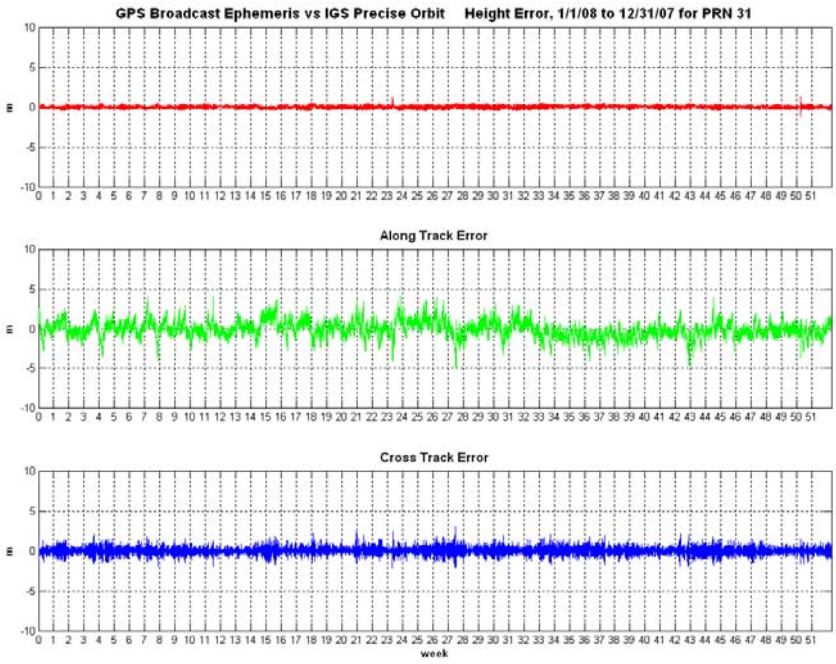


Figure 12-35 Orbit Error PRN-32 (SVN-23)

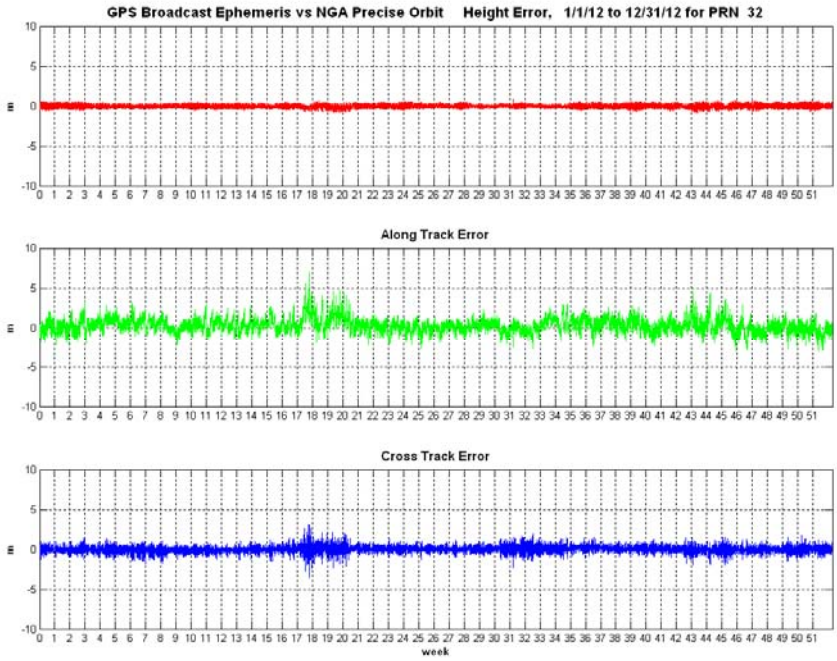


Figure 12-36 QQ Plots of Range Error PRNs 1 to 4

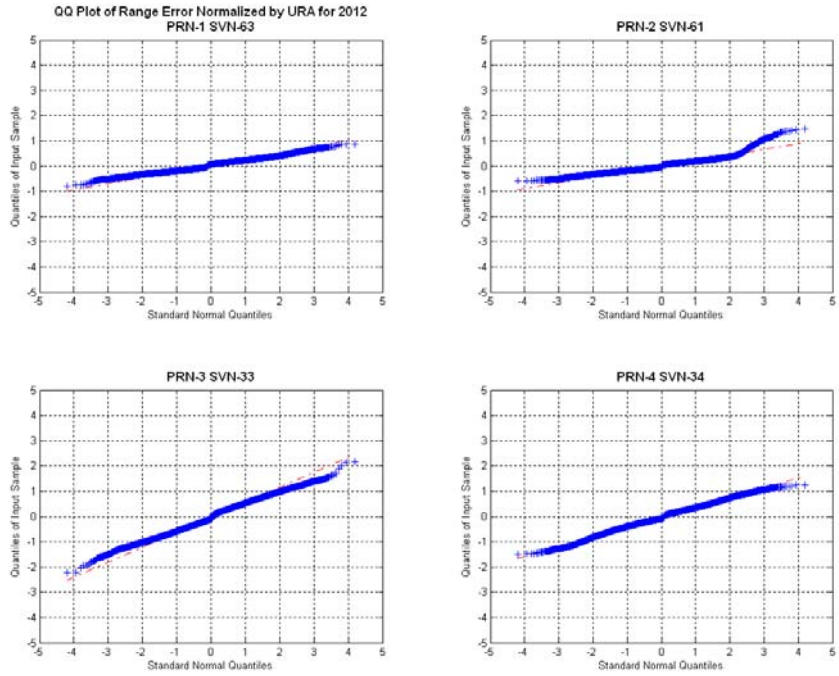


Figure 12-37 QQ Plots of Range Error PRNs 5 to 8

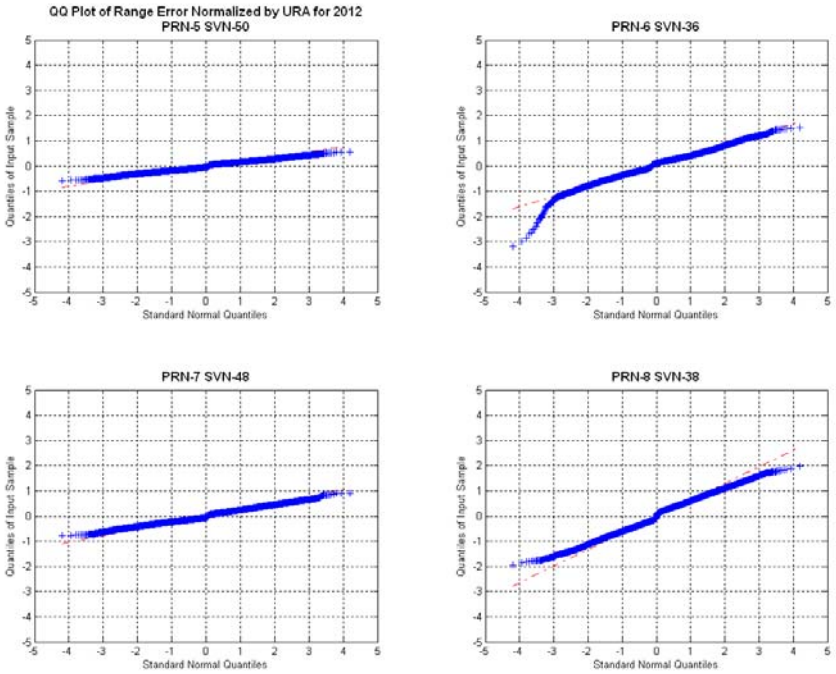


Figure 12-38 QQ Plots of Range Error PRNs 9 to 12

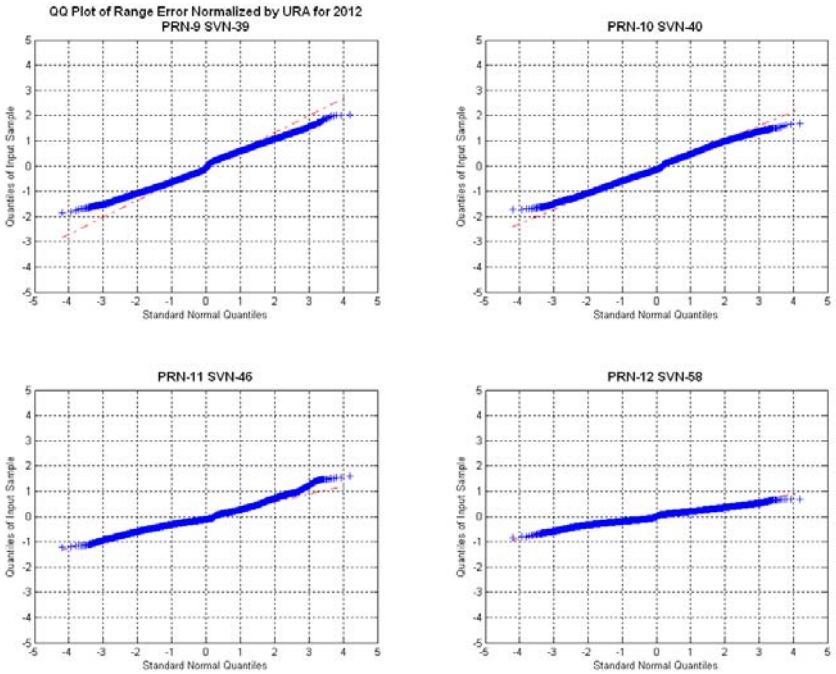


Figure 12-39 QQ Plots of Range Error PRNs 13 to 16

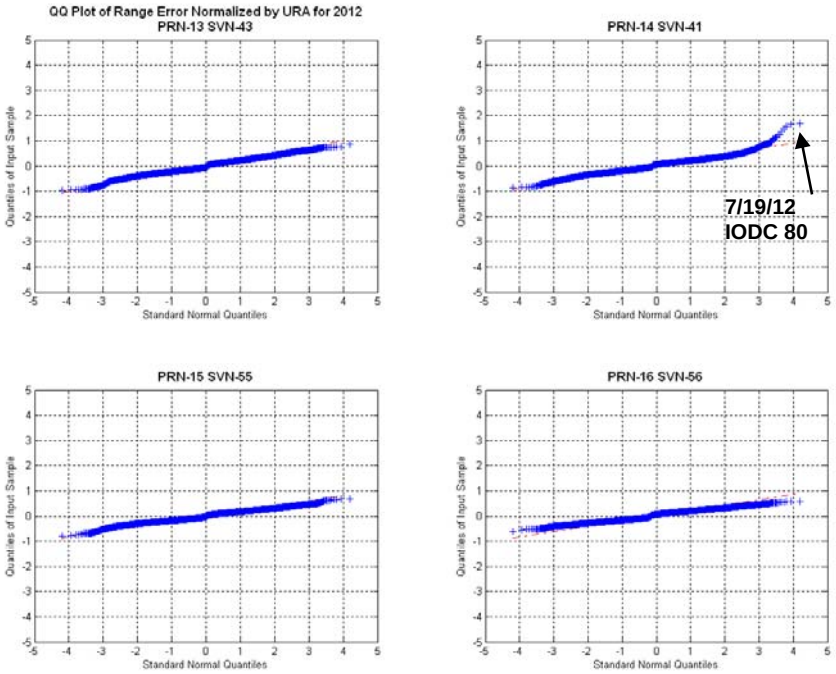


Figure 12-40 QQ Plots of Range Error PRNs 17 to 20

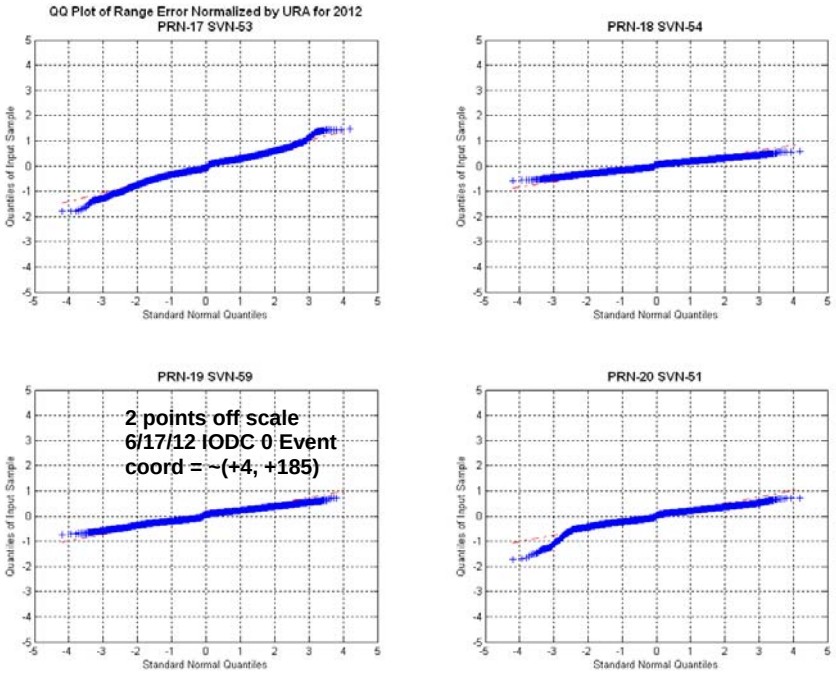


Figure 12-41 QQ Plots of Range Error PRNs 21 to 24

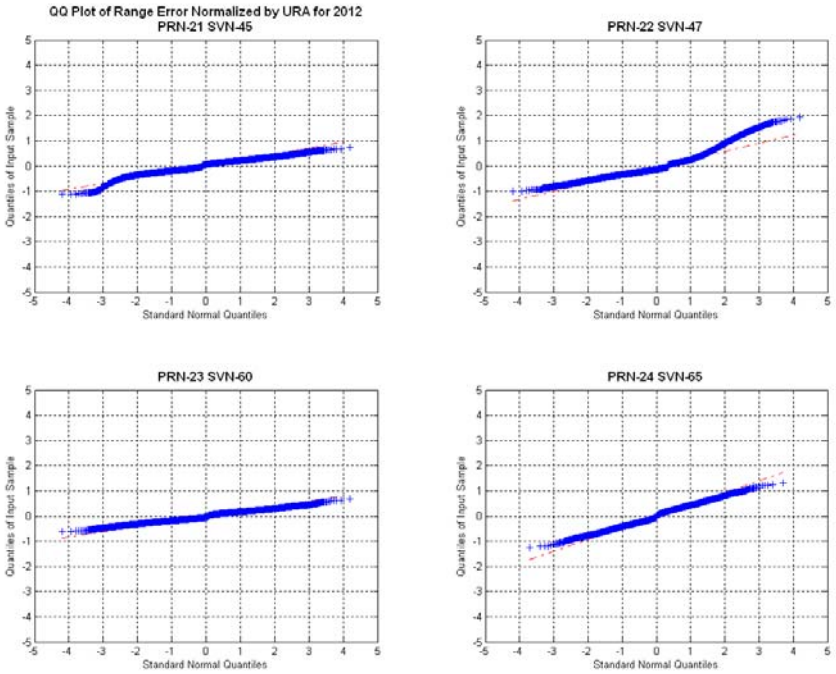


Figure 12-42 QQ Plots of Range Error PRNs 25 to 28

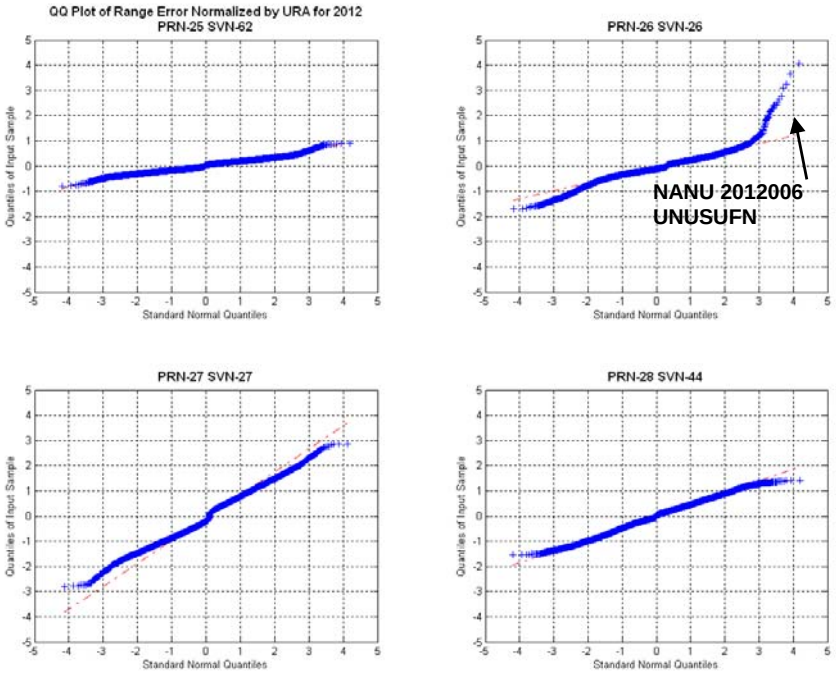


Figure 12-43 QQ Plots of Range Error PRNs 29 to 32

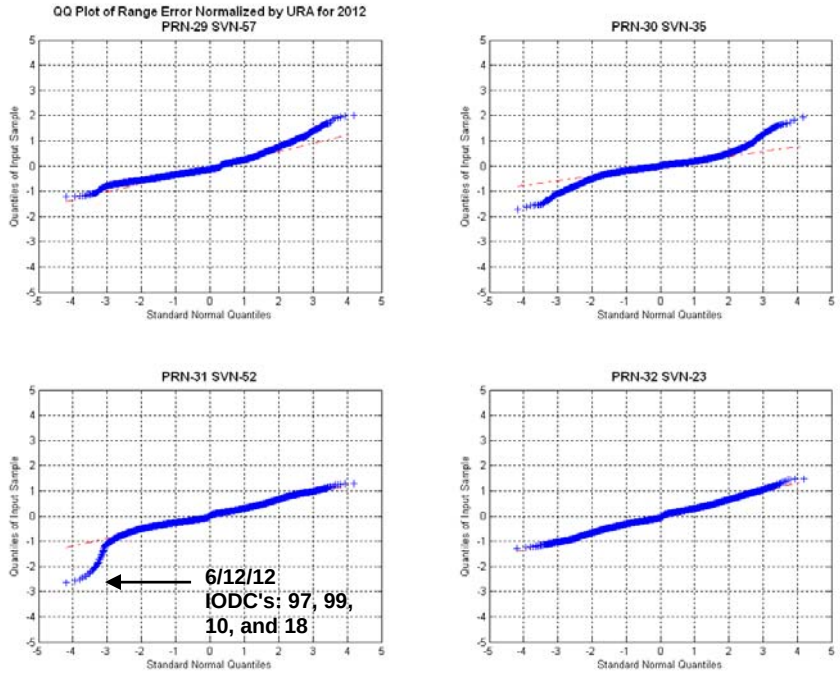


Figure 12-44 Histograms of H, A, C, and Range Error PRN-1

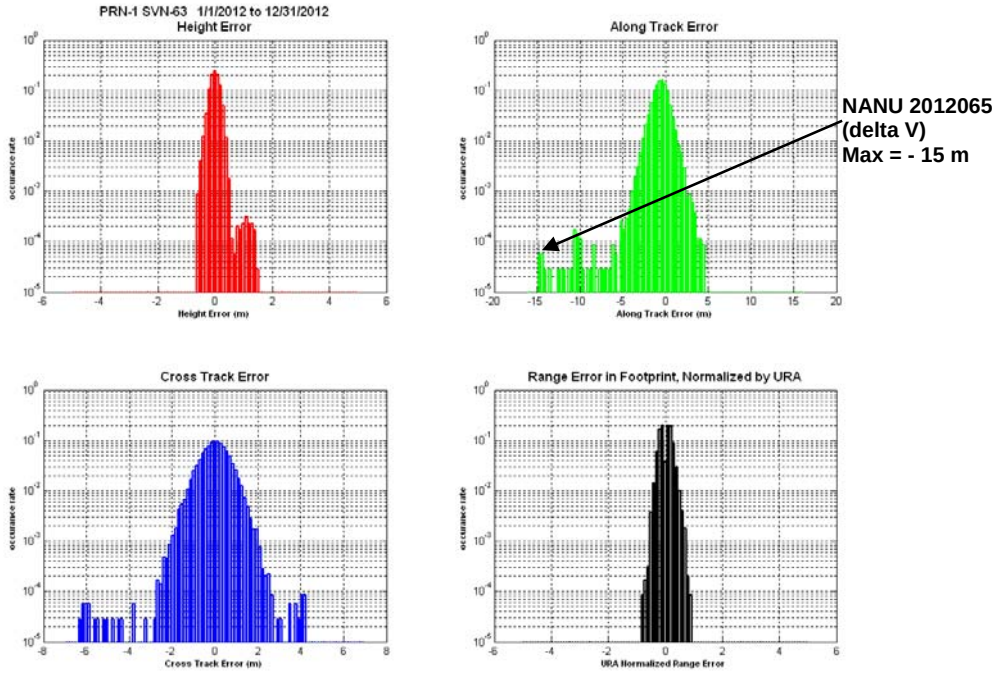


Figure 12-45 Histograms of H, A, C, and Range Error PRN-2

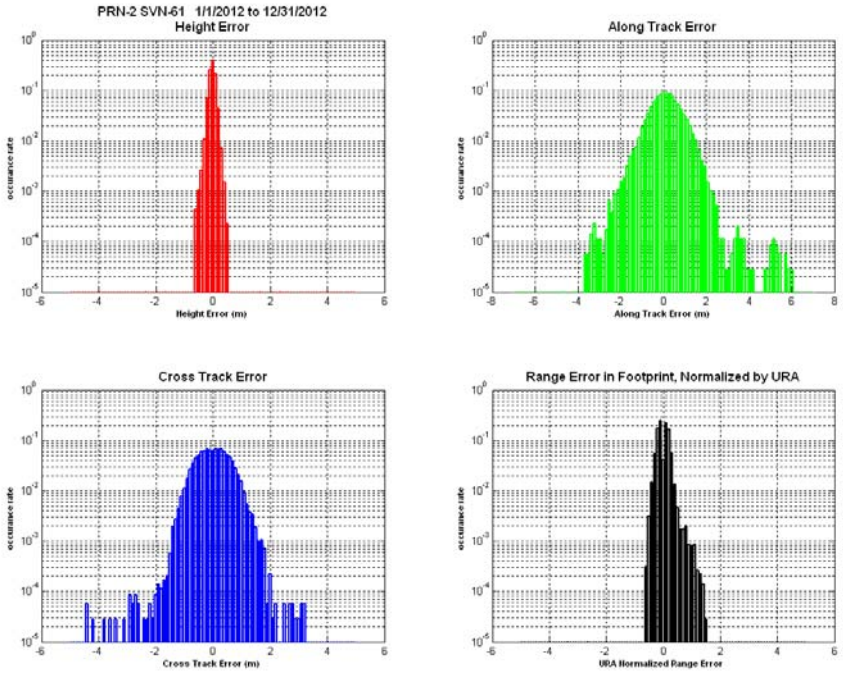


Figure 12-46 Histograms of H, A, C, and Range Error PRN-3

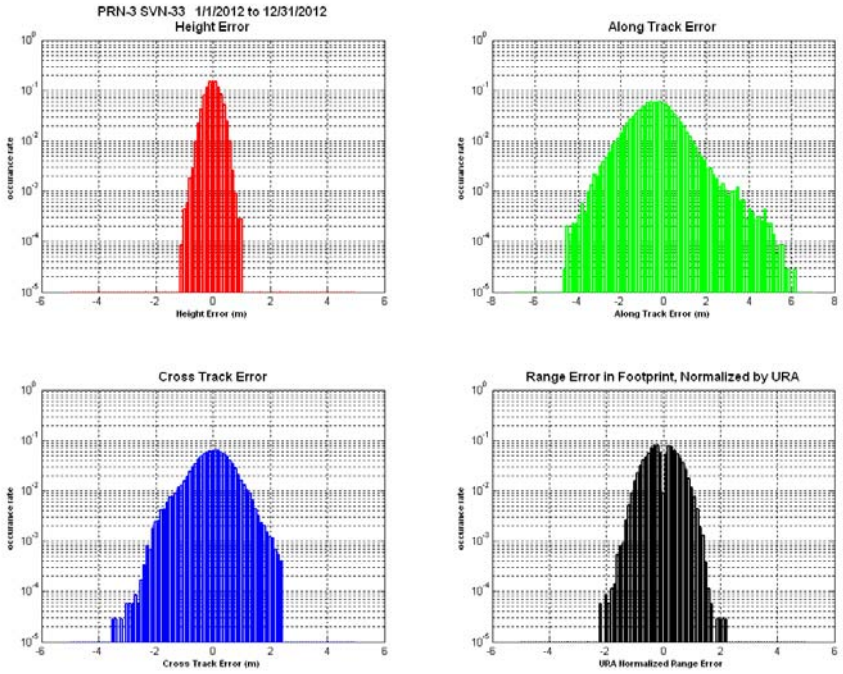


Figure 12-47 Histograms of H, A, C, and Range Error PRN-4

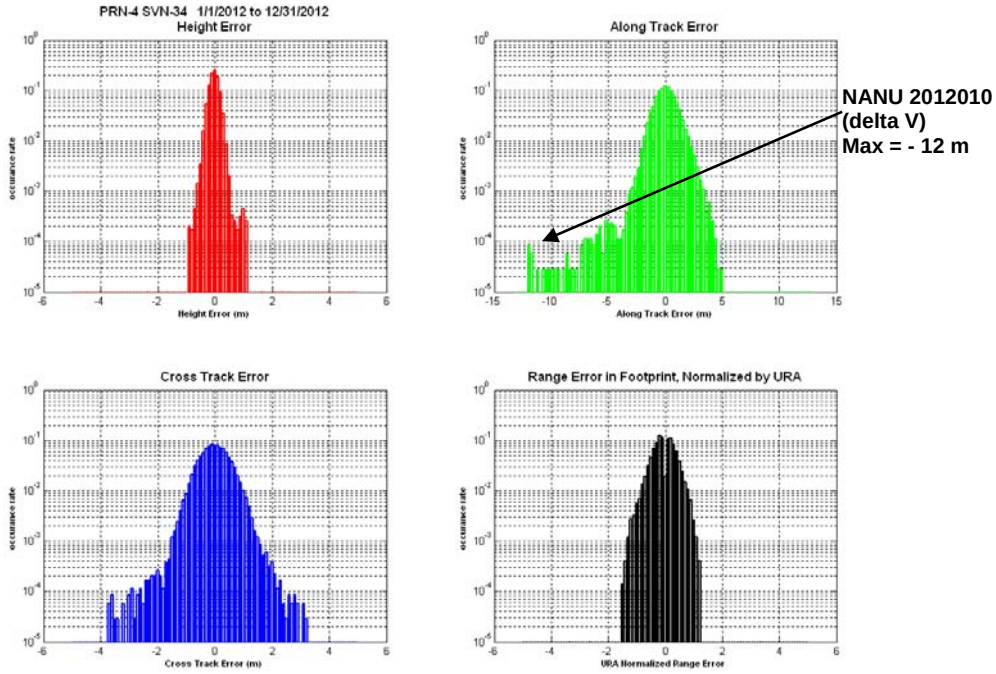


Figure 12-48 Histograms of H, A, C, and Range Error PRN-5

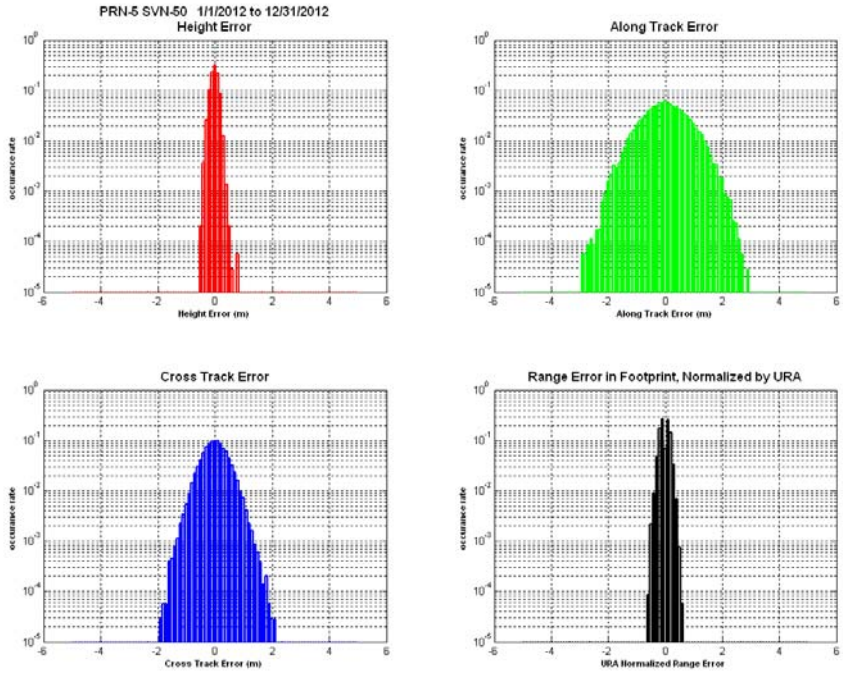


Figure 12-49 Histograms of H, A, C, and Range Error PRN-6

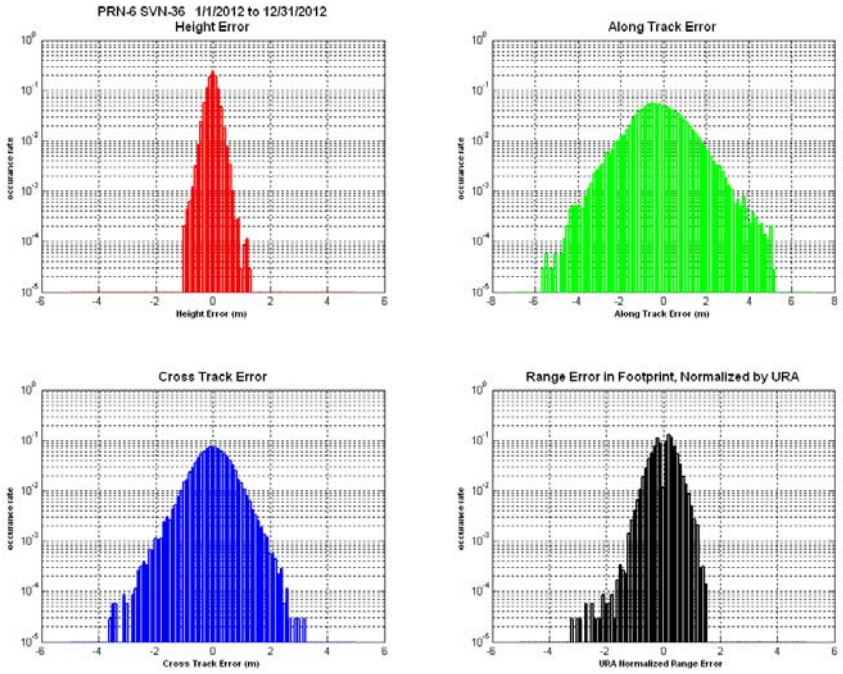


Figure 12-50 Histograms of H, A, C, and Range Error PRN-7

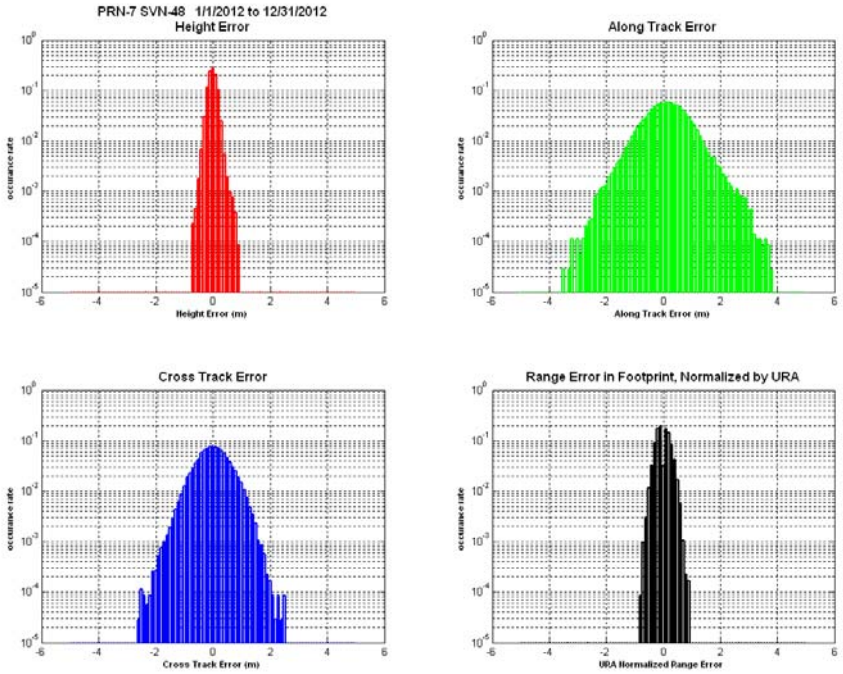


Figure 12-51 Histograms of H, A, C, and Range Error PRN-8

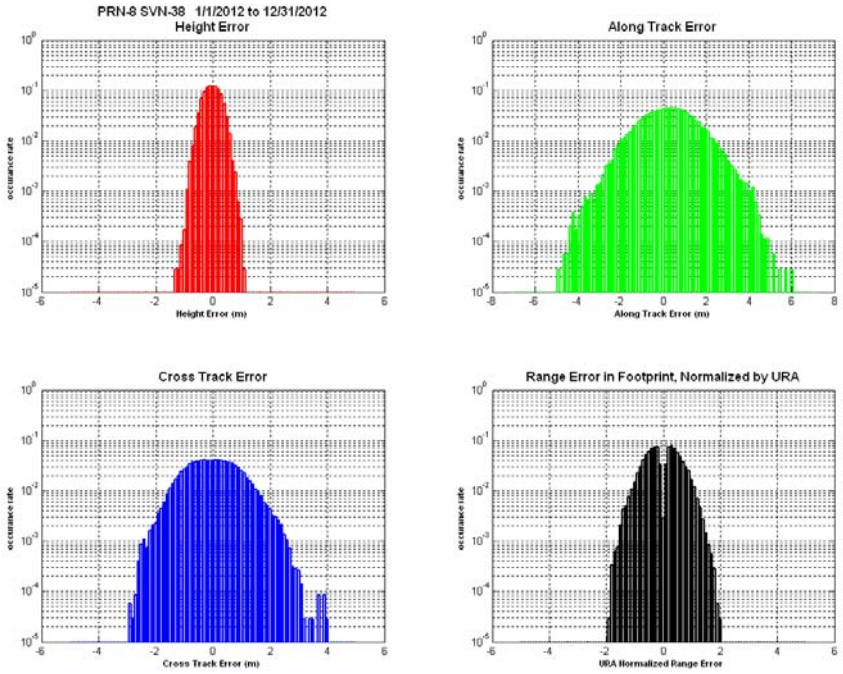


Figure 12-52 Histograms of H, A, C, and Range Error PRN-9

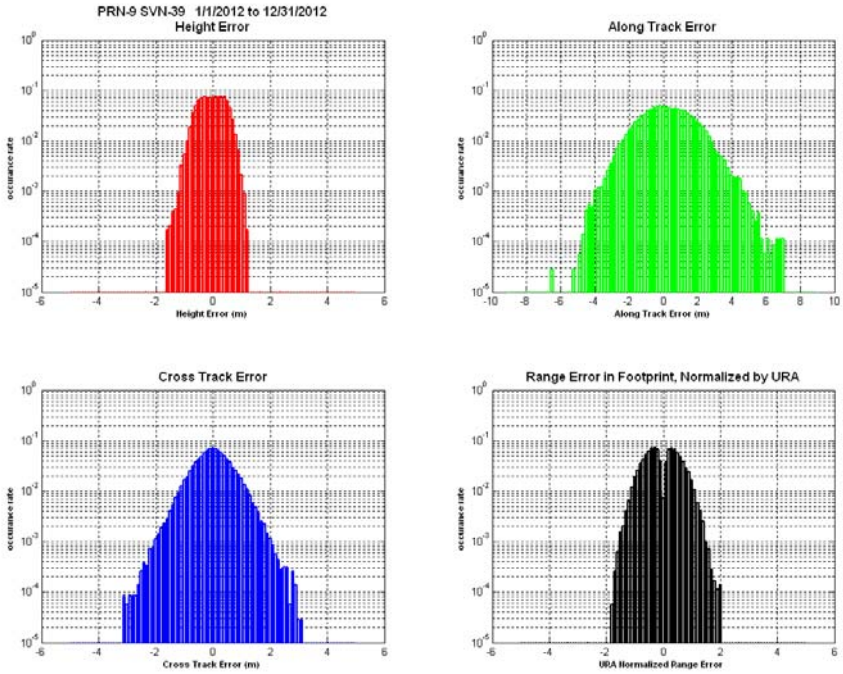


Figure 12-53 Histograms of H, A, C, and Range Error PRN-10

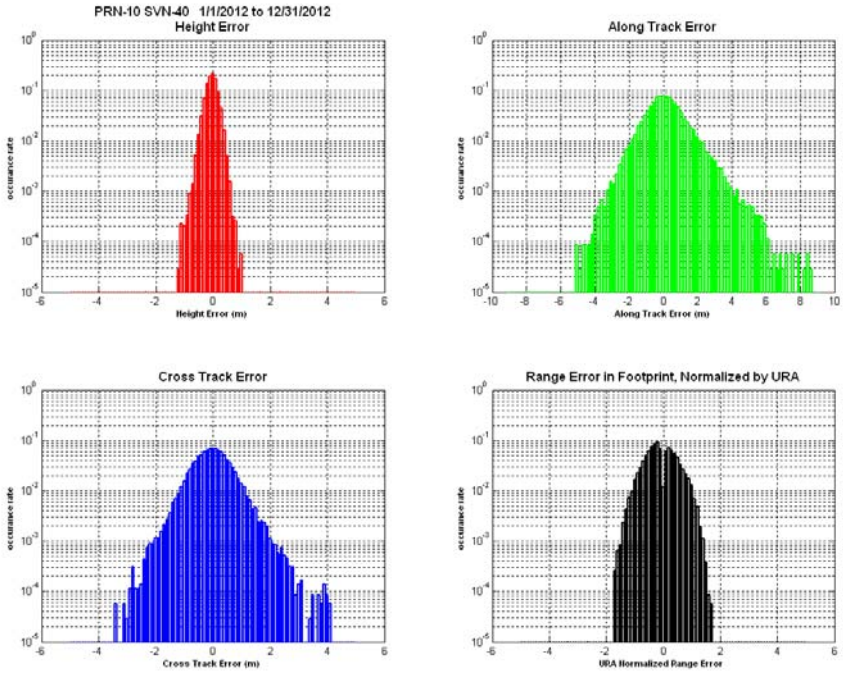


Figure 12-54 Histograms of H, A, C, and Range Error PRN-11

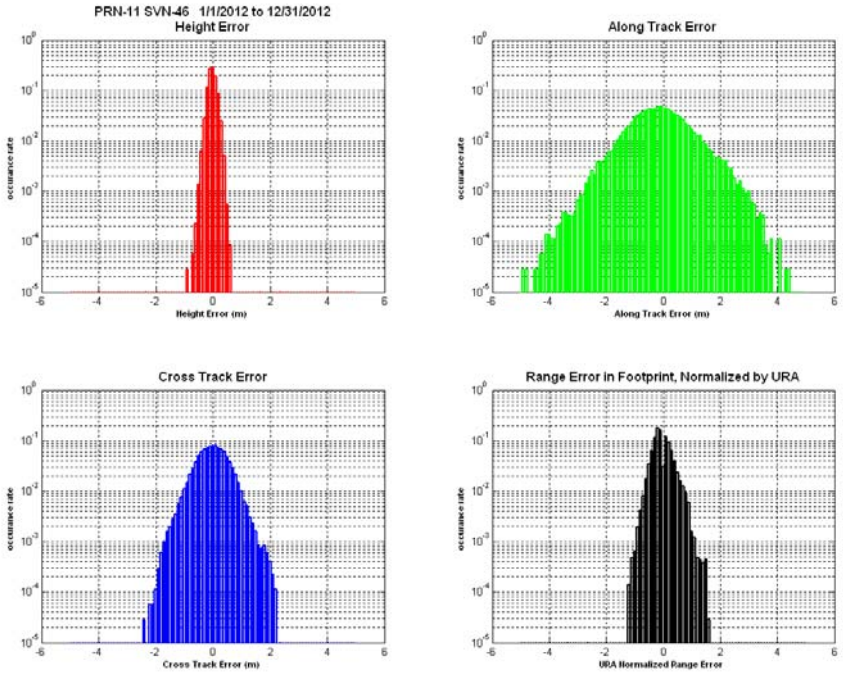


Figure 12-55 Histograms of H, A, C, and Range Error PRN-12

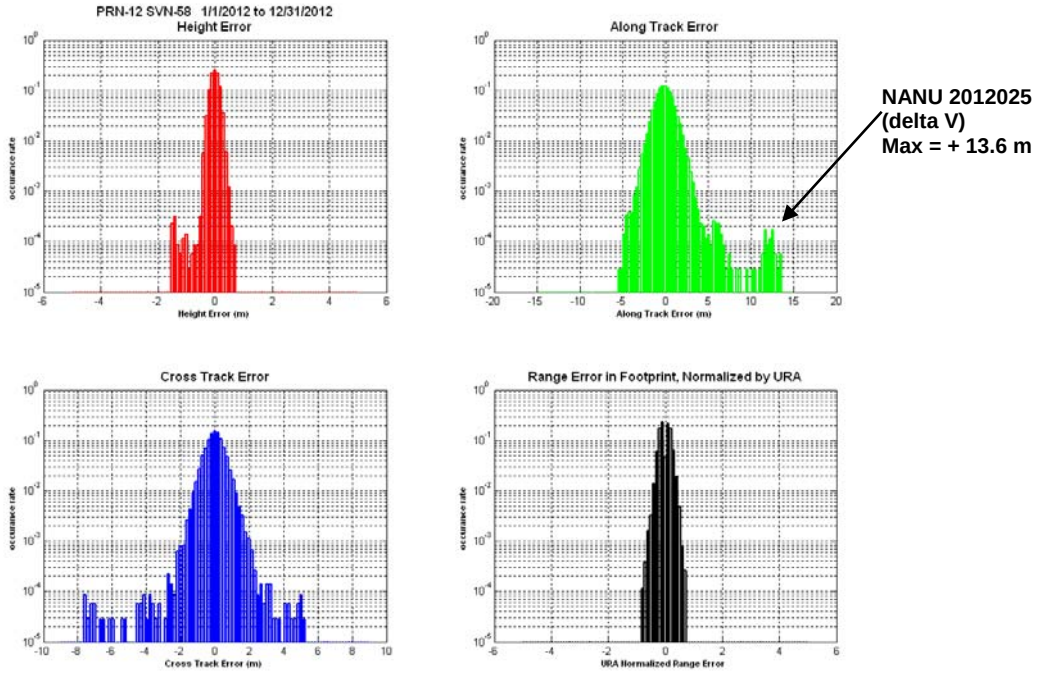


Figure 12-56 Histograms of H, A, C, and Range Error PRN-13

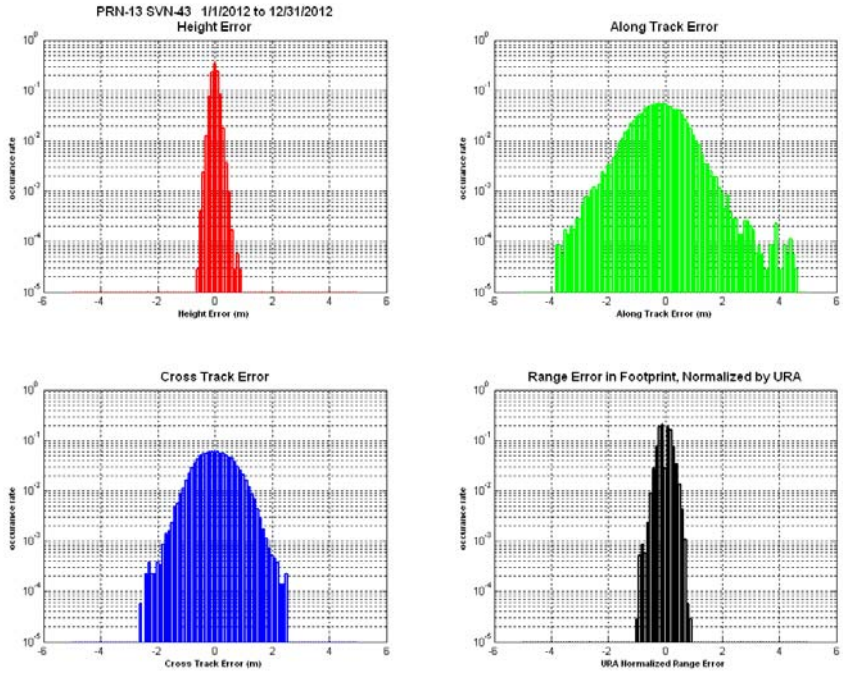


Figure 12-57 Histograms of H, A, C, and Range Error PRN-14

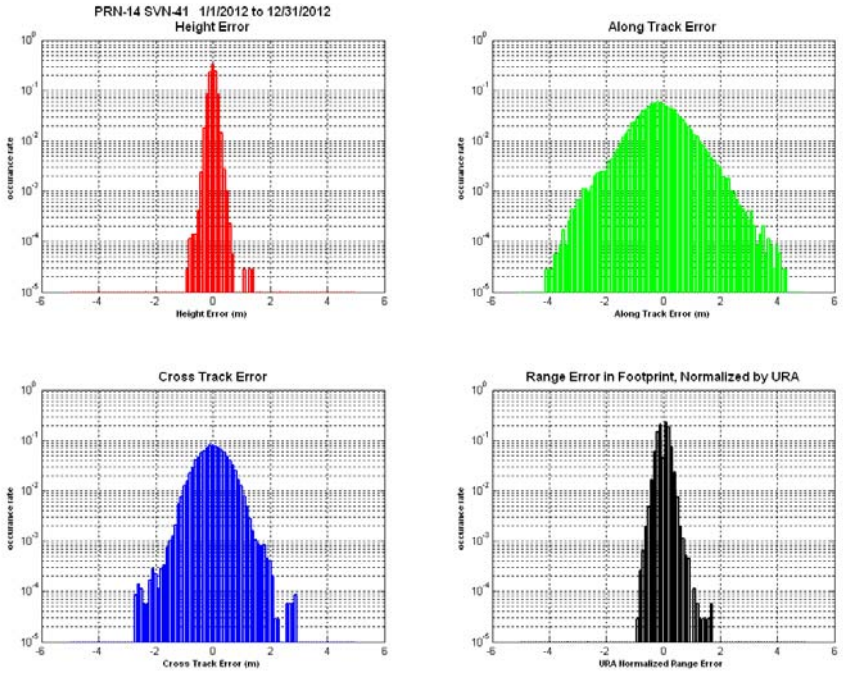


Figure 12-58 Histograms of H, A, C, and Range Error PRN-15

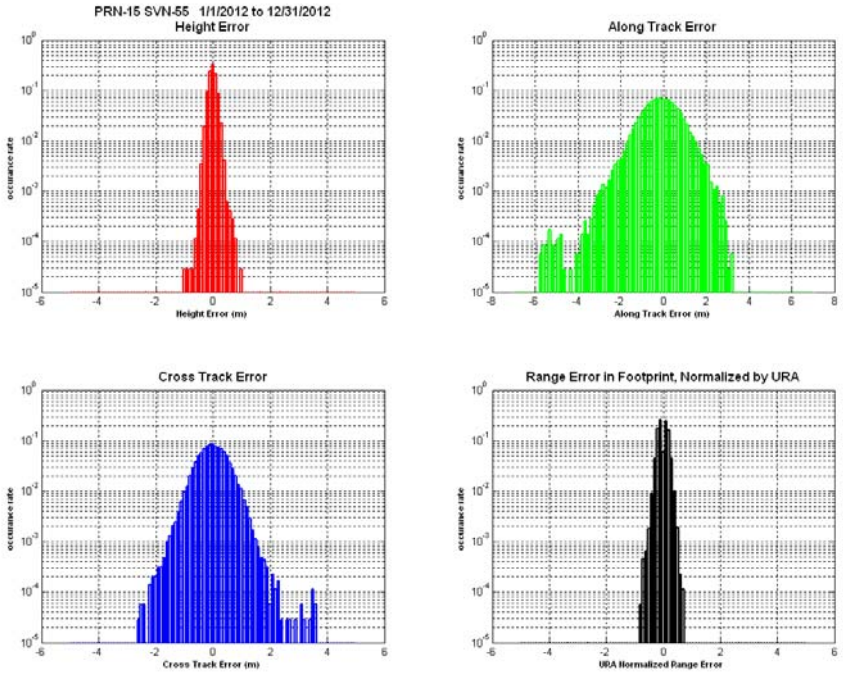


Figure 12-59 Histograms of H, A, C, and Range Error PRN-16

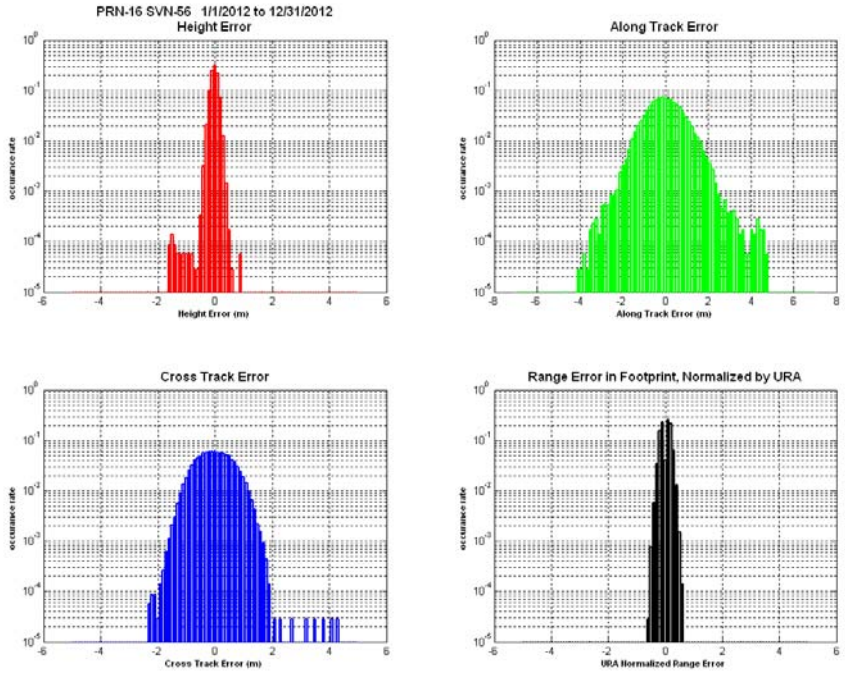


Figure 12-60 Histograms of H, A, C, and Range Error PRN-17

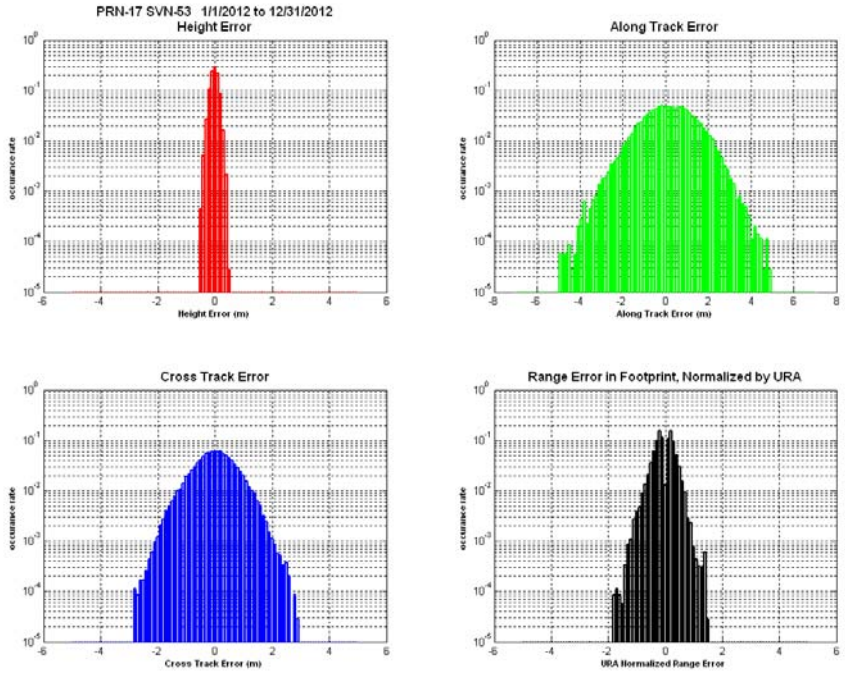


Figure 12-61 Histograms of H, A, C, and Range Error PRN-18

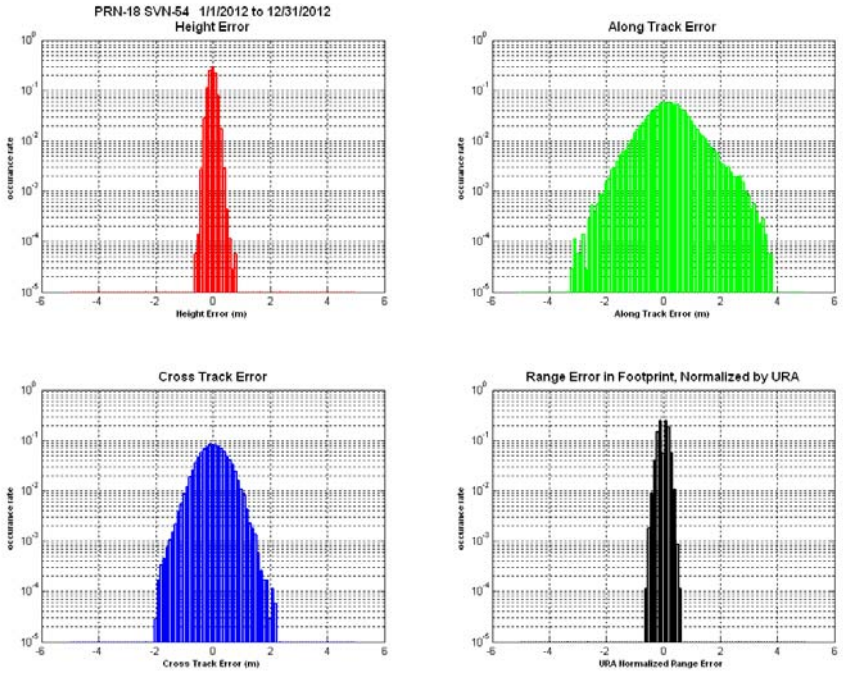
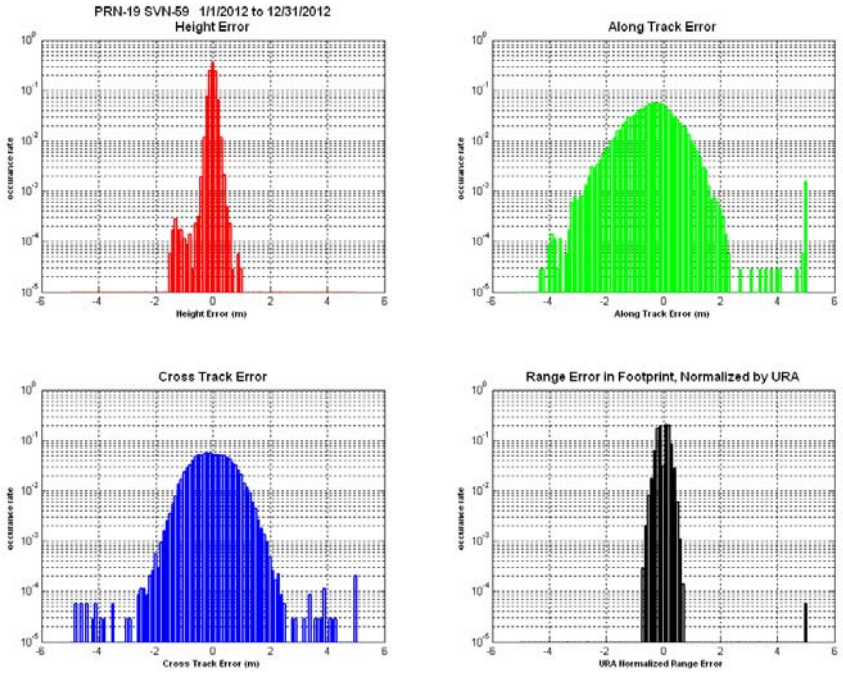


Figure 12-62 Histograms of H, A, C, and Range Error PRN-19



6/17/12 IODC 00 Event
+5 bin overloaded
3 places
xtrak = ~ 1900 m
atrak = ~ 300 m
norm error = ~ 185

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

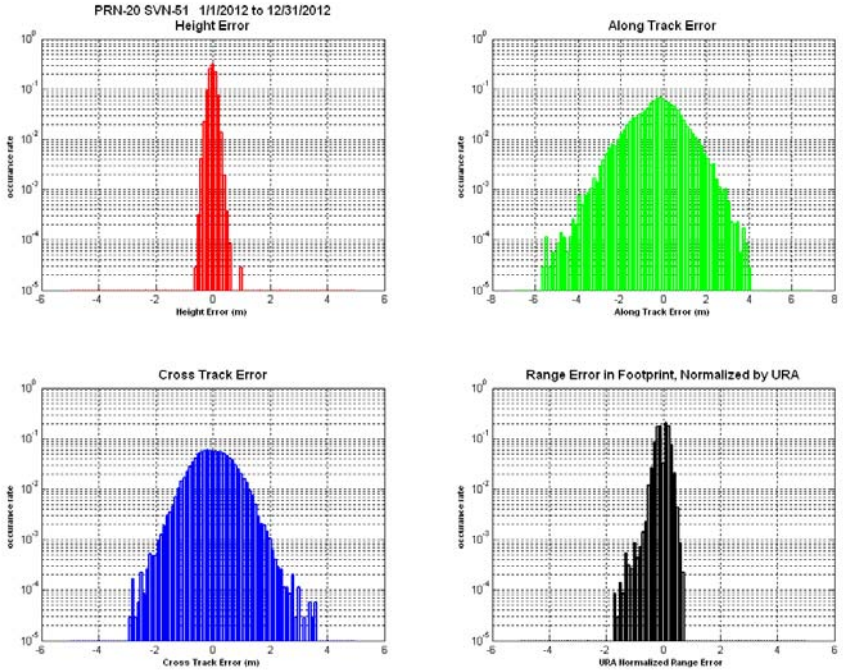


Figure 12-64 Histograms of H, A, C, and Range Error PRN-21

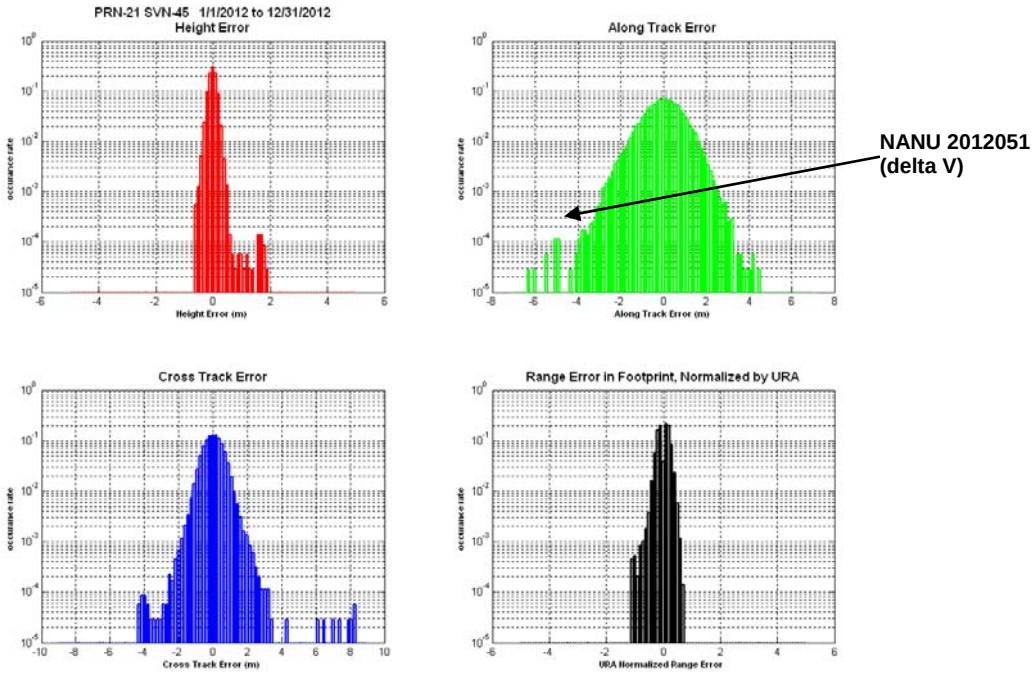


Figure 12-65 Histograms of H, A, C, and Range Error PRN-22

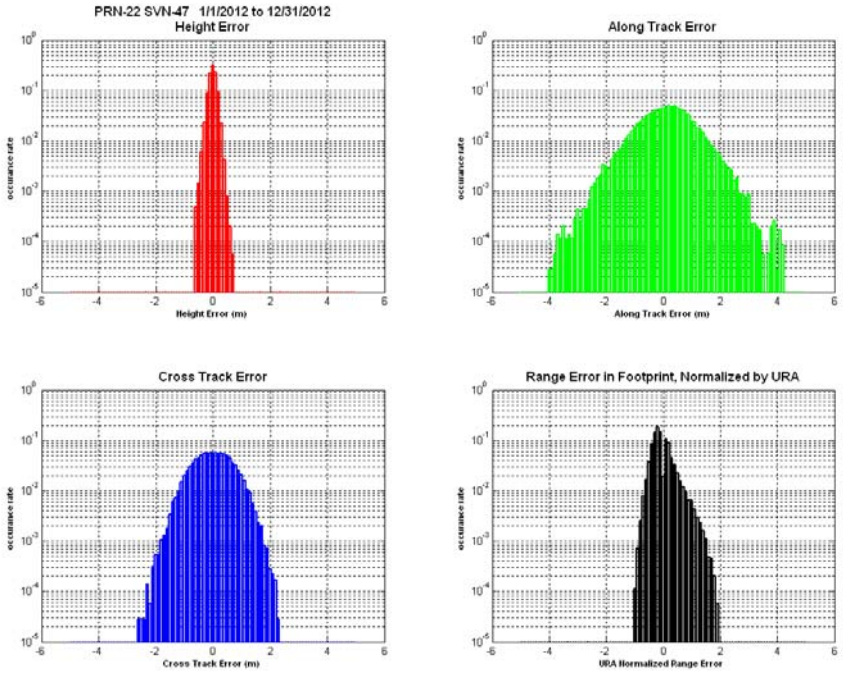


Figure 12-66 Histograms of H, A, C, and Range Error PRN-23

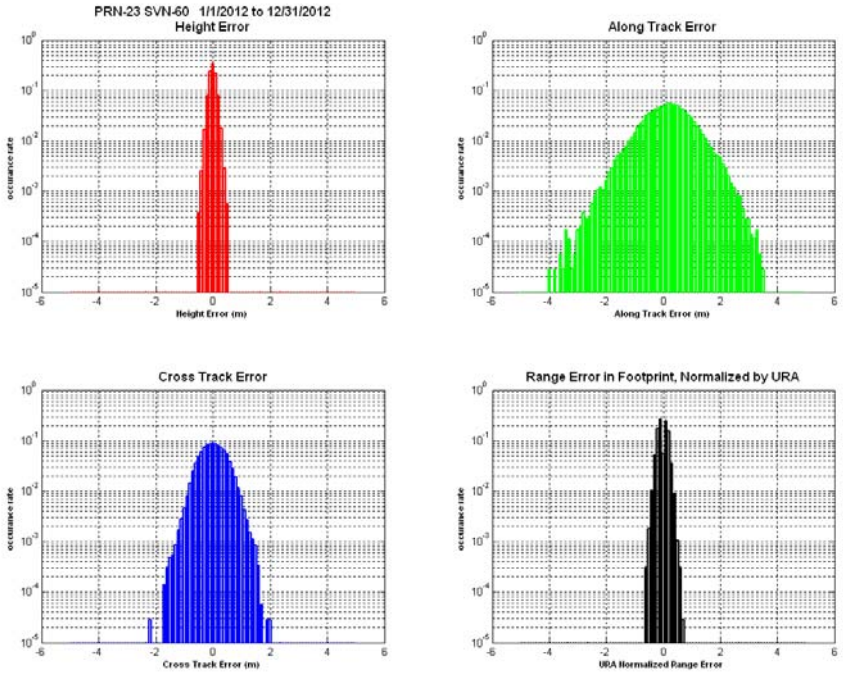


Figure 12-67 Histograms of H, A, C, and Range Error PRN-24

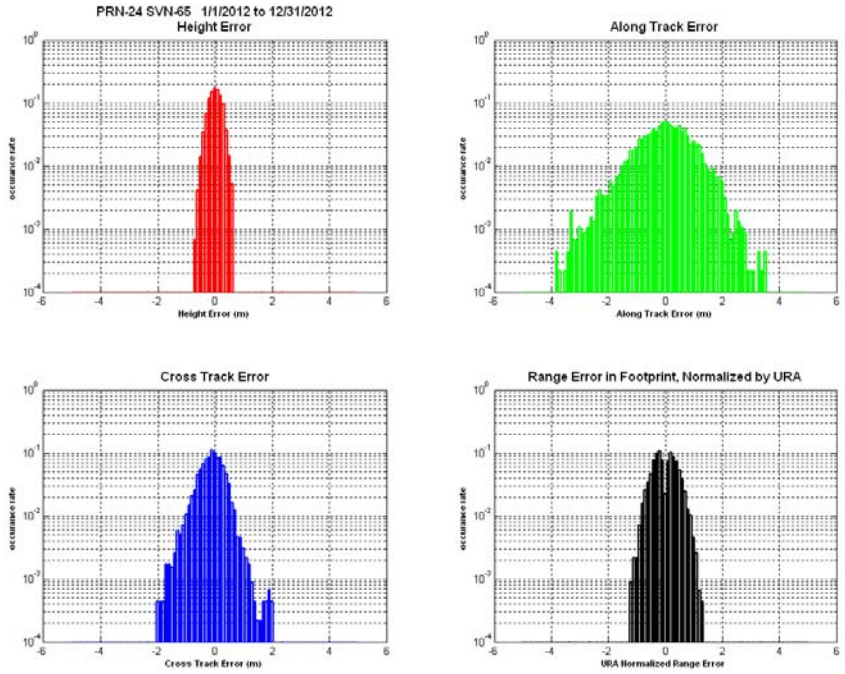


Figure 12-68 Histograms of H, A, C, and Range Error PRN-25

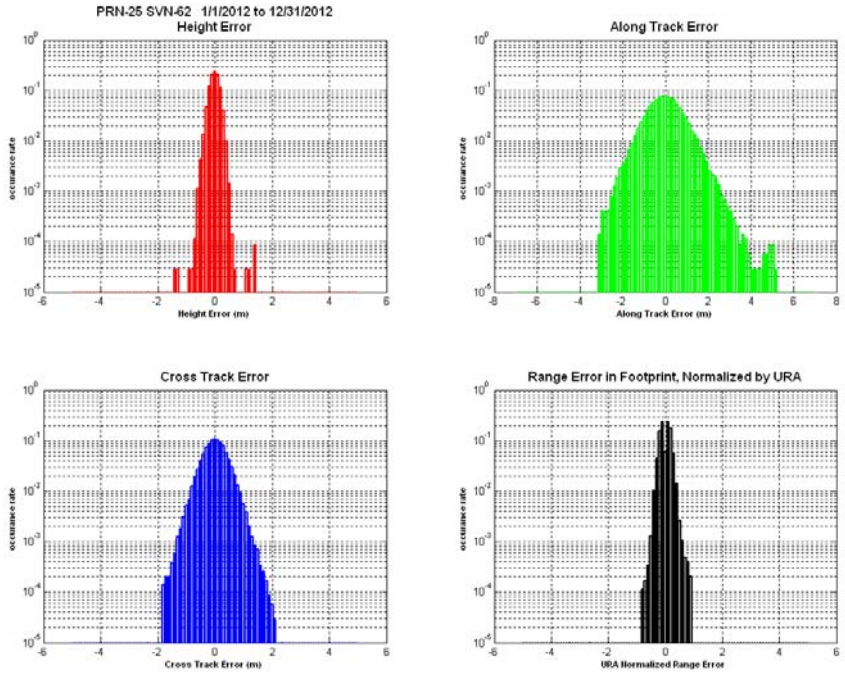


Figure 12-69 Histograms of H, A, C, and Range Error PRN-26

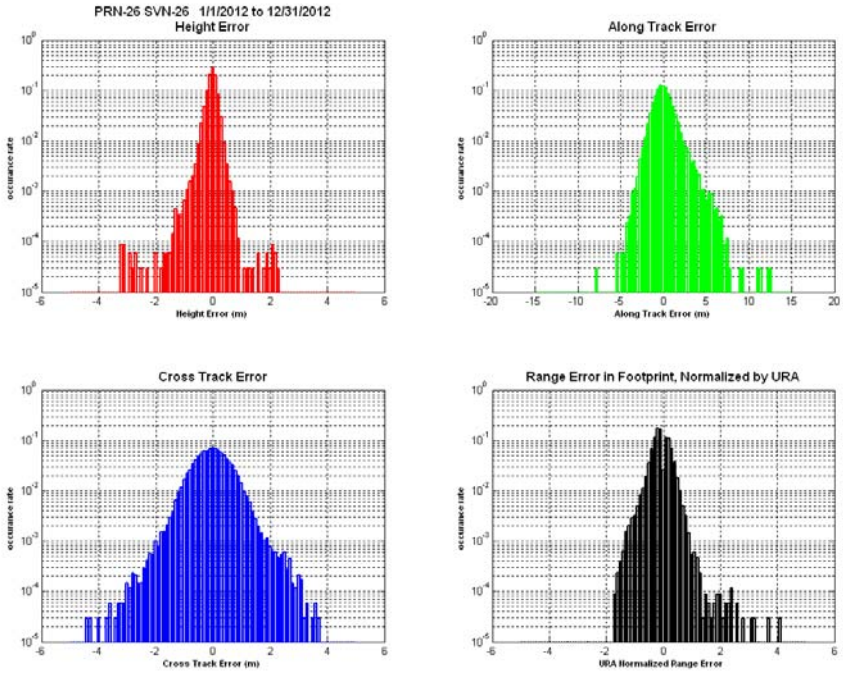


Figure 12-70 Histograms of H, A, C, and Range Error PRN-27

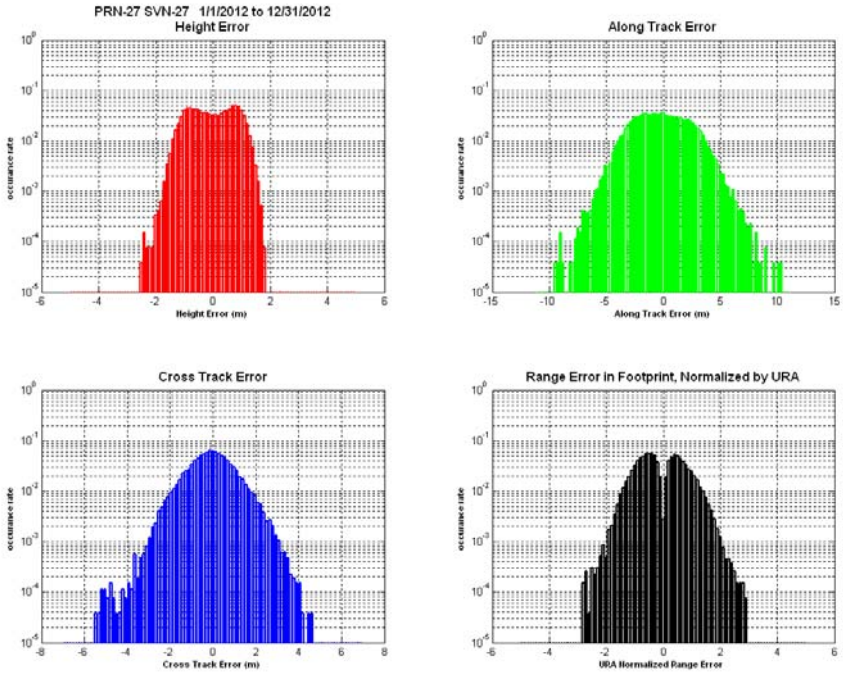


Figure 12-71 Histograms of H, A, C, and Range Error PRN-28

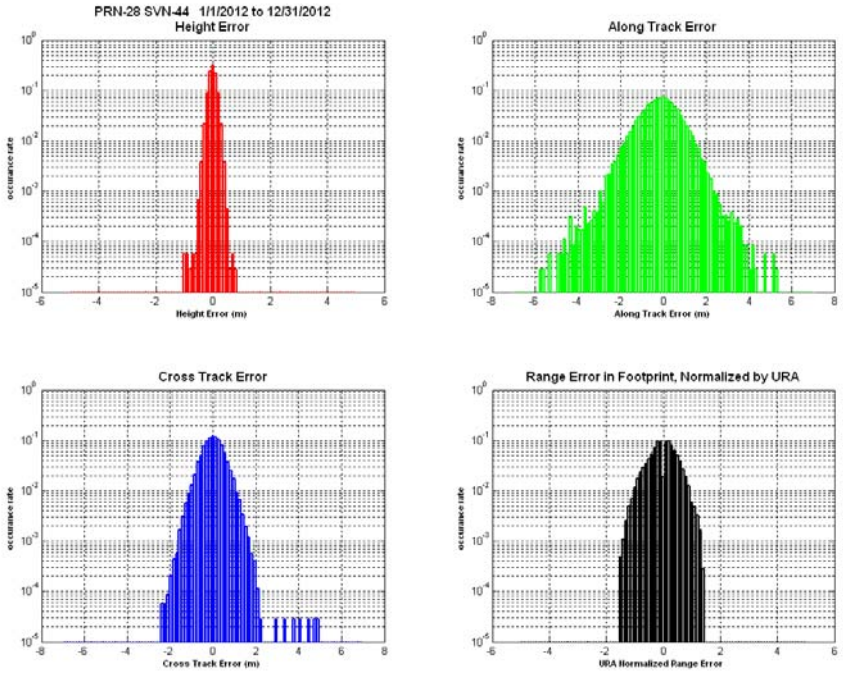


Figure 12-72 Histograms of H, A, C, and Range Error PRN-29

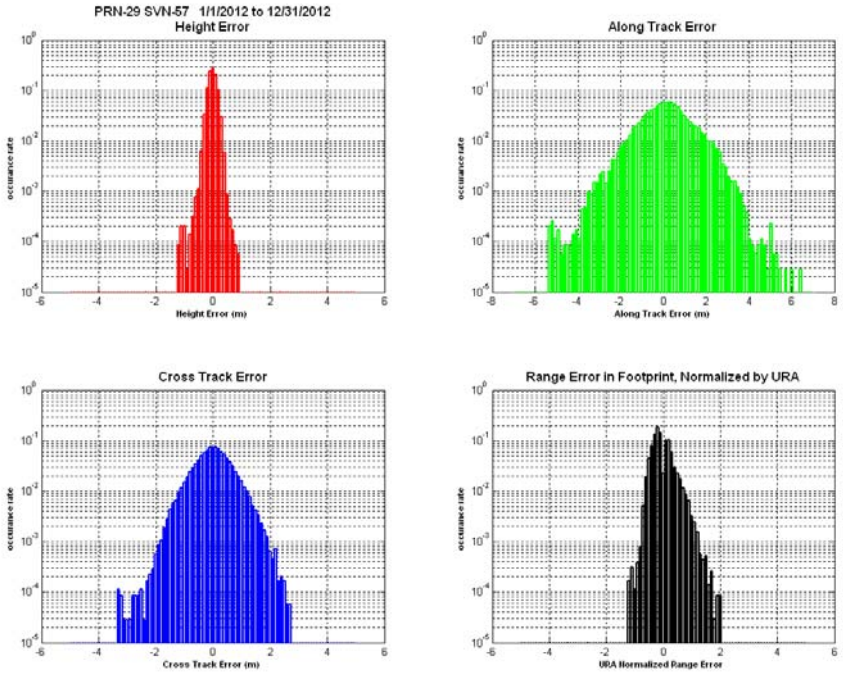


Figure 12-73 Histograms of H, A, C, and Range Error PRN-30

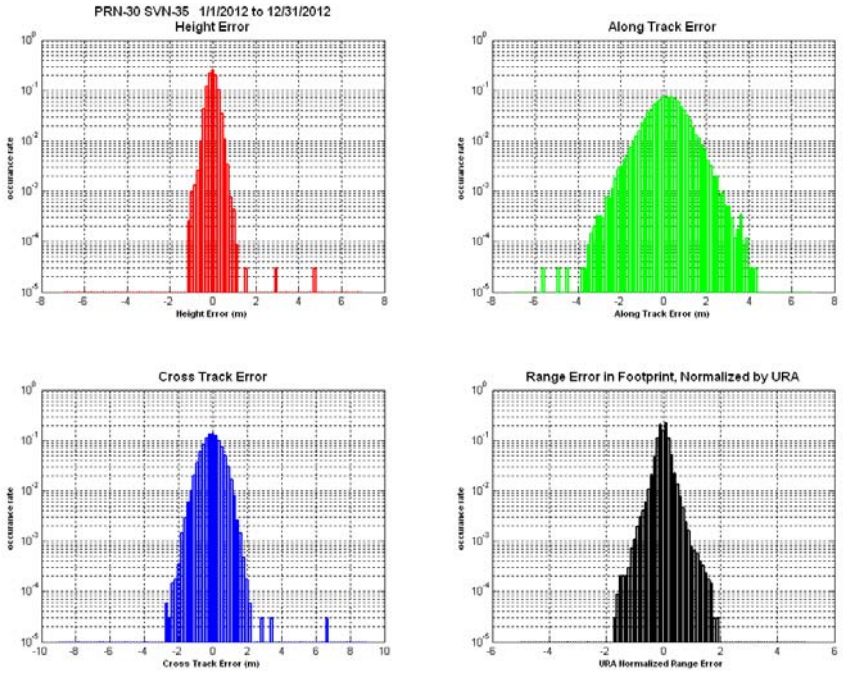
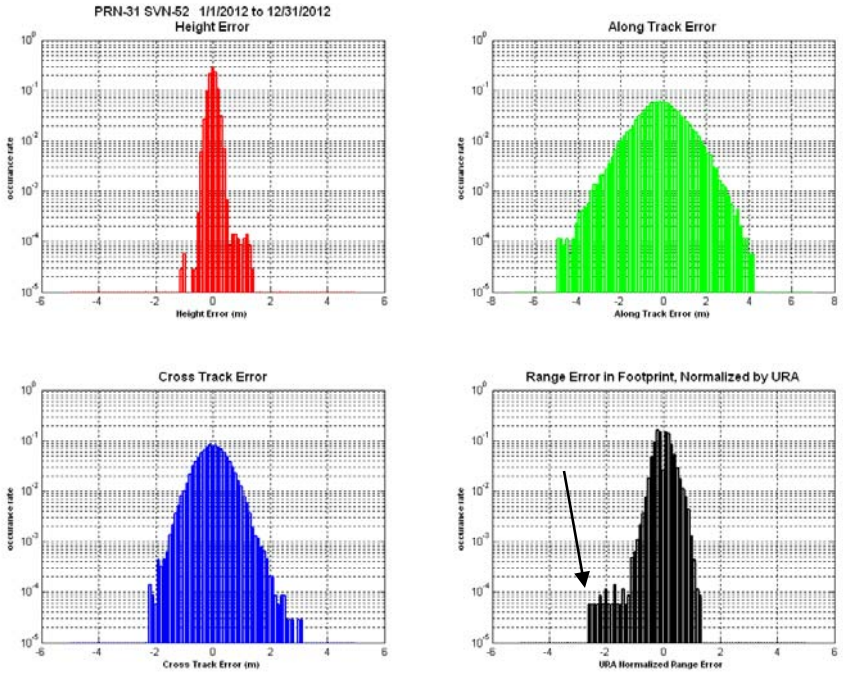


Figure 12-74 Histograms of H, A, C, and Range Error PRN-31



6/12/12 IODCs: 97, 99, 10, and 18

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

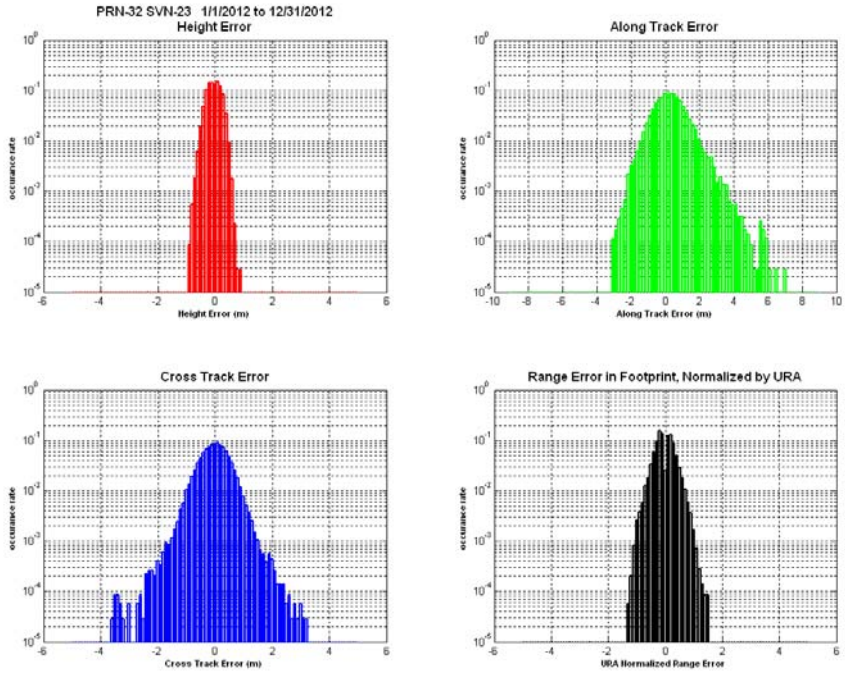


Figure 12-76 Timeline of URA Normalized Range Error PRN-1 SVN-63

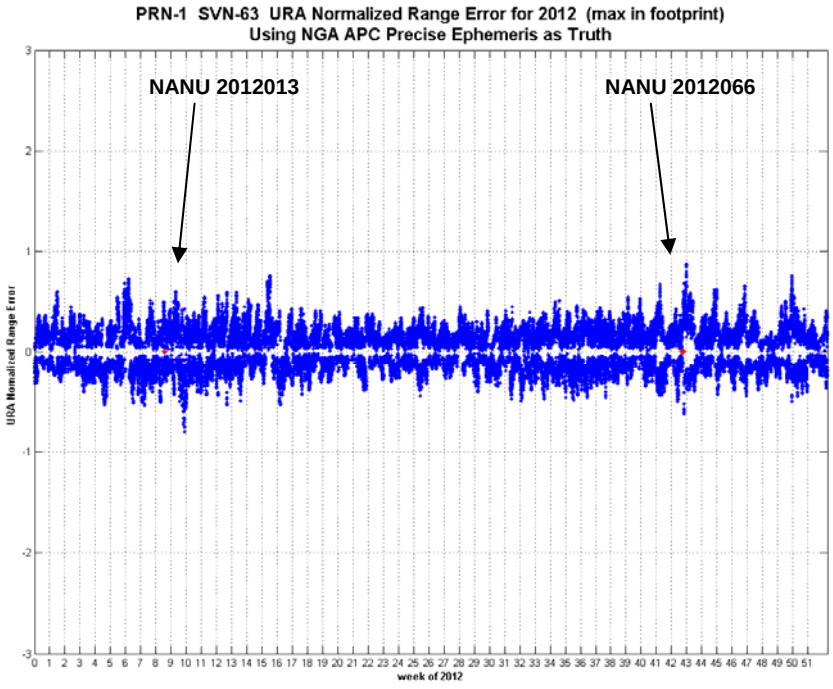


Figure 12-77 Timeline of URA Normalized Range Error PRN-2 SVN-61

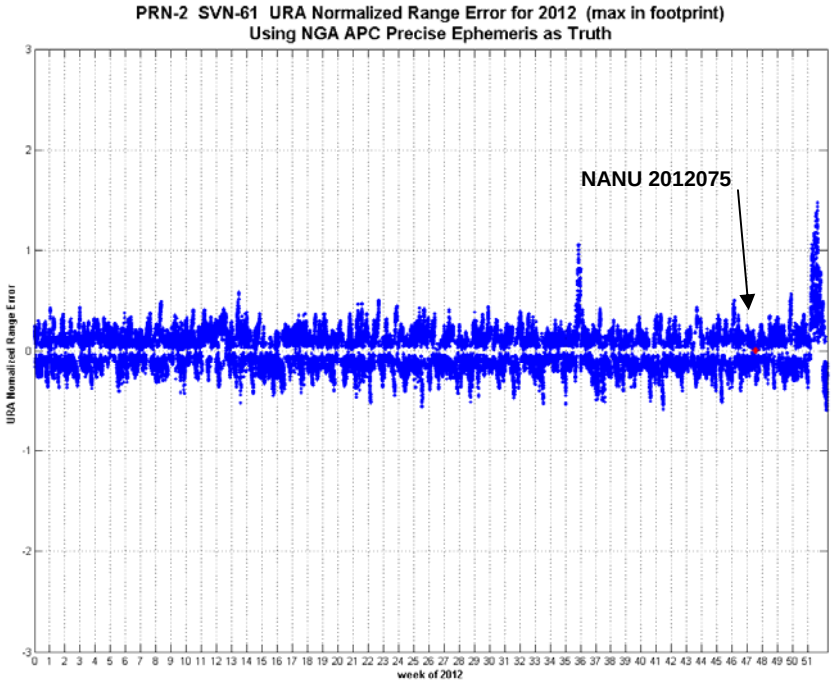


Figure 12-78 Timeline of URA Normalized Range Error PRN-3 SVN-33

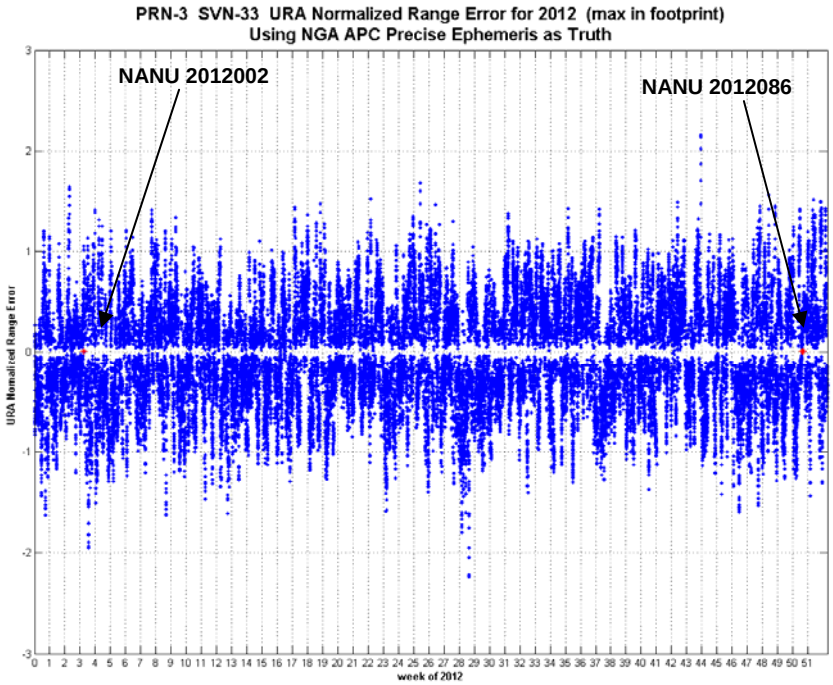


Figure 12-79 Timeline of URA Normalized Range Error PRN-4 SV-34

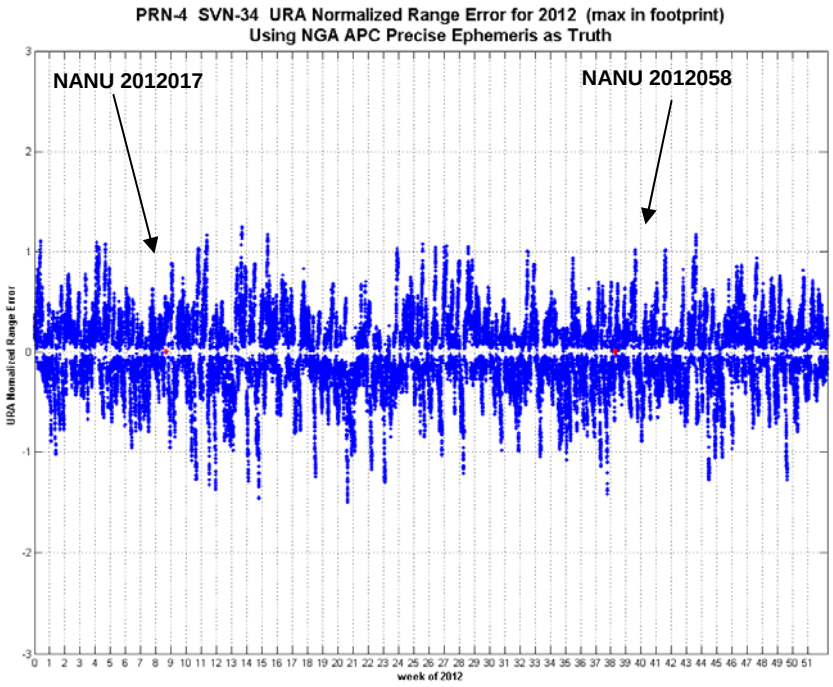


Figure 12-80 Timeline of URA Normalized Range Error PRN-5 SVN-50

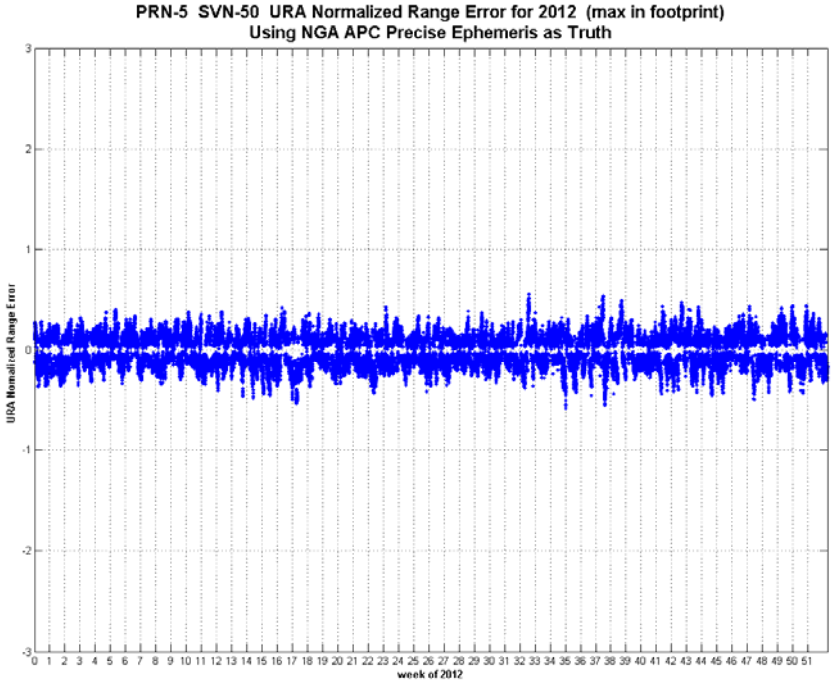


Figure 12-81 Timeline of URA Normalized Range Error PRN-6 SVN-36

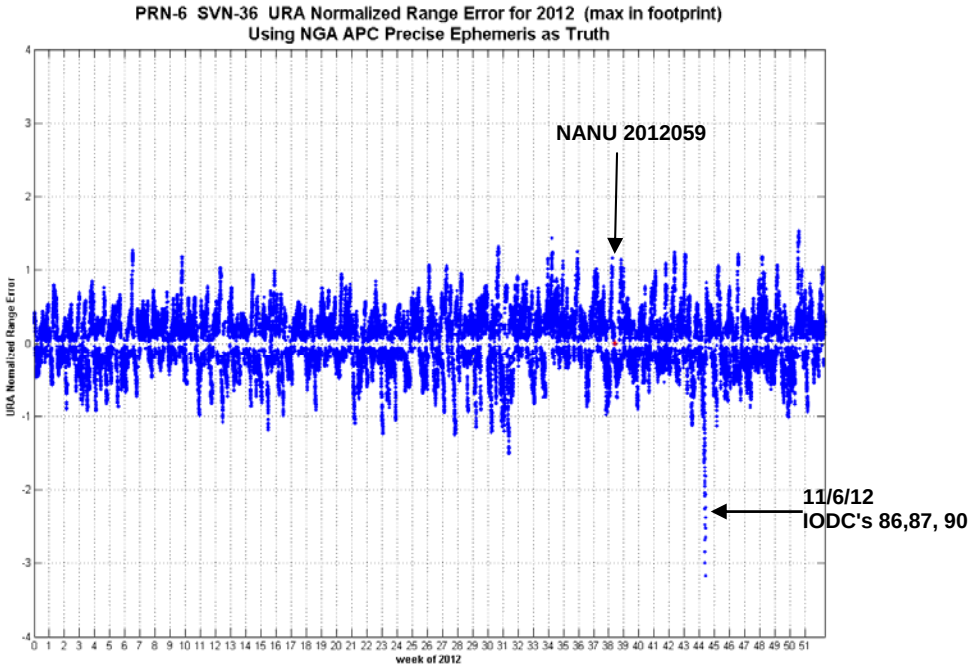


Figure 12-82 Timeline of URA Normalized Range Error PRN-7 SVN-48

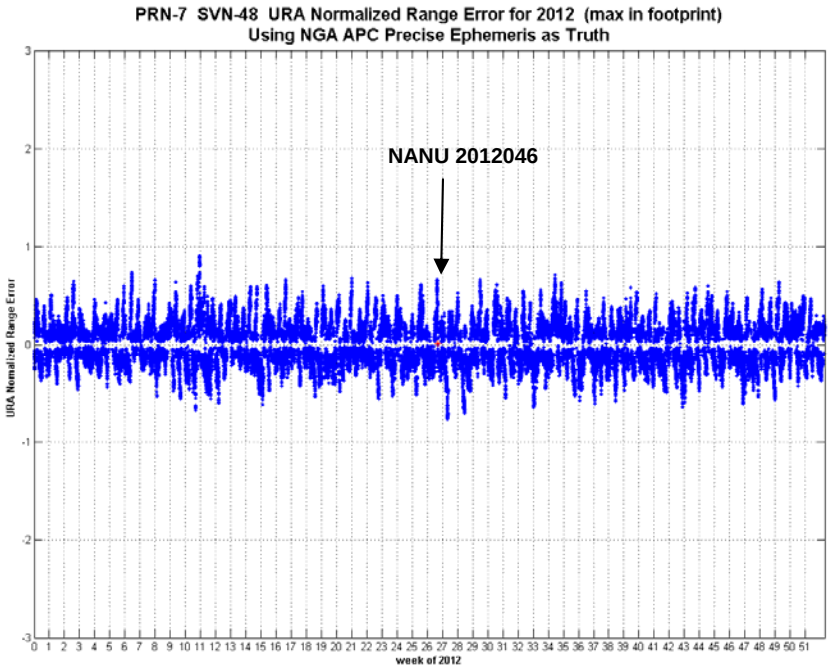


Figure 12-83 Timeline of URA Normalized Range Error PRN-8 SVN-38

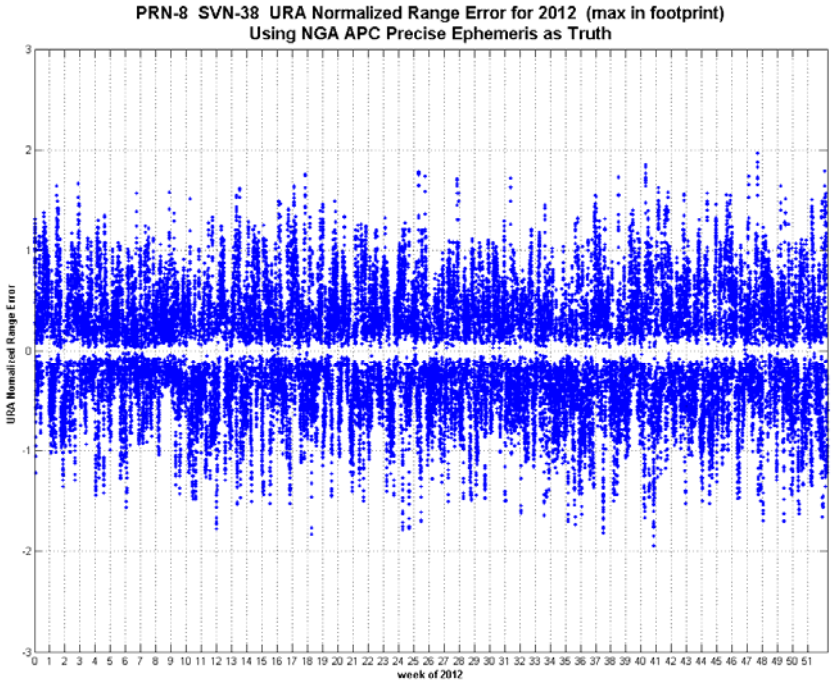


Figure 12-84 Timeline of URA Normalized Range Error PRN-9 SVN-39

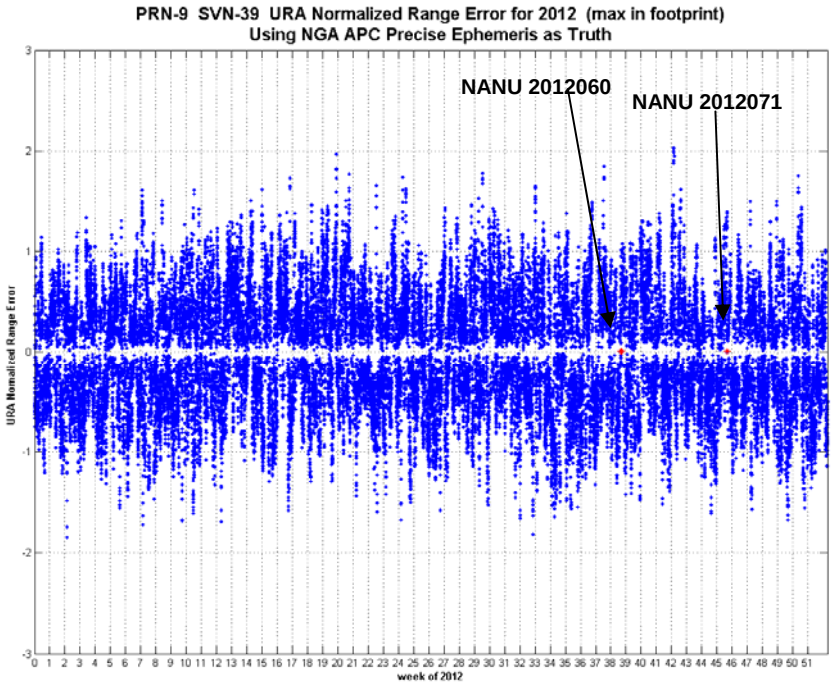


Figure 12-85 Timeline of URA Normalized Range Error PRN-10 SVN-40

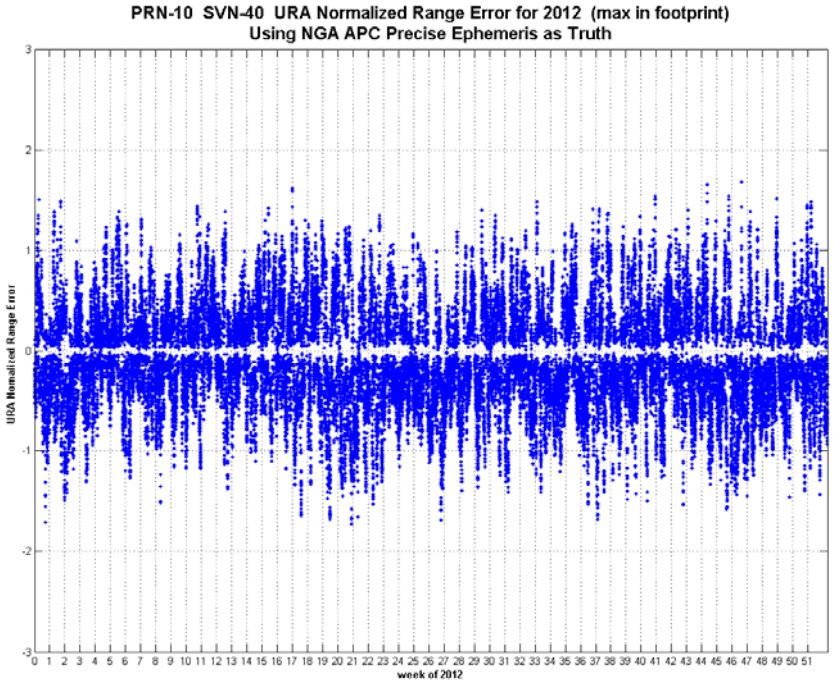


Figure 12-86 Timeline of URA Normalized Range Error PRN-11 SVN-46

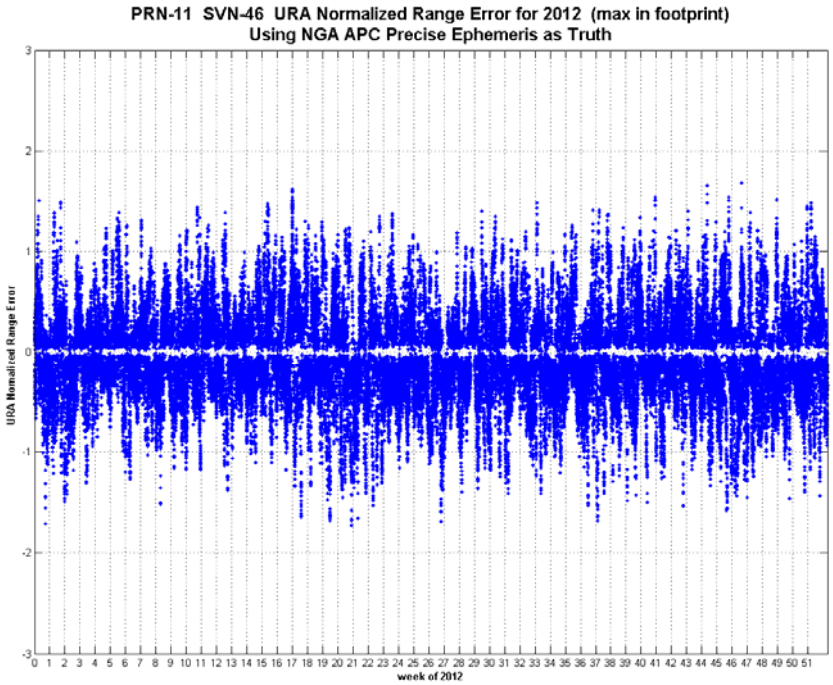


Figure 12-87 Timeline of URA Normalized Range Error PRN-12 SVN-58

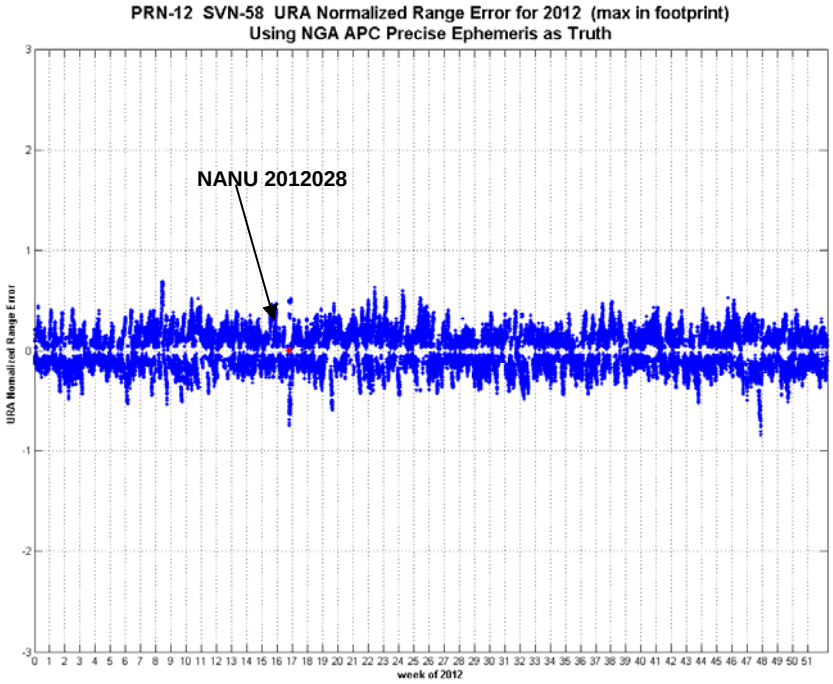


Figure 12-88 Timeline of URA Normalized Range Error PRN-13 SVN-43

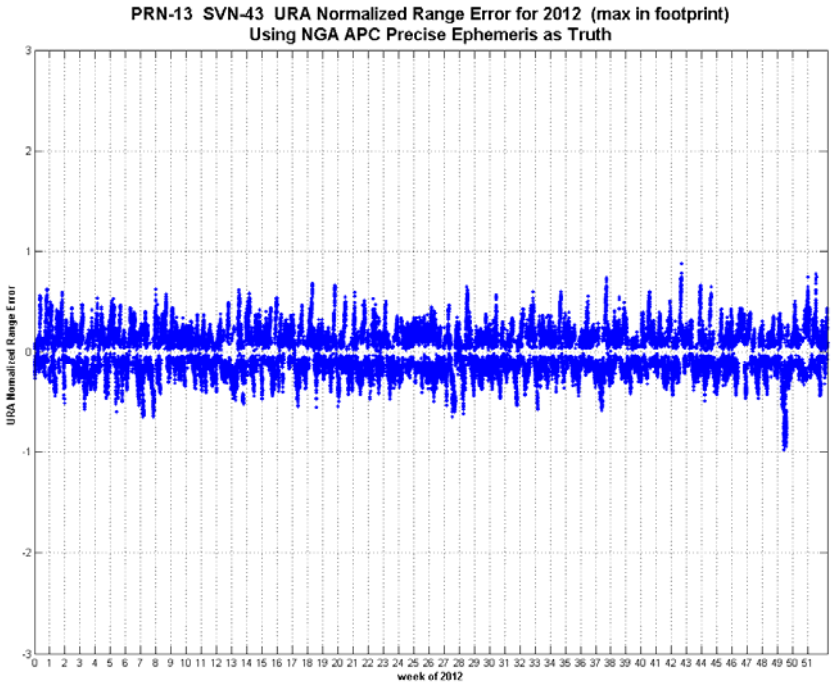


Figure 12-89 Timeline of URA Normalized Range Error PRN-14 SVN-41

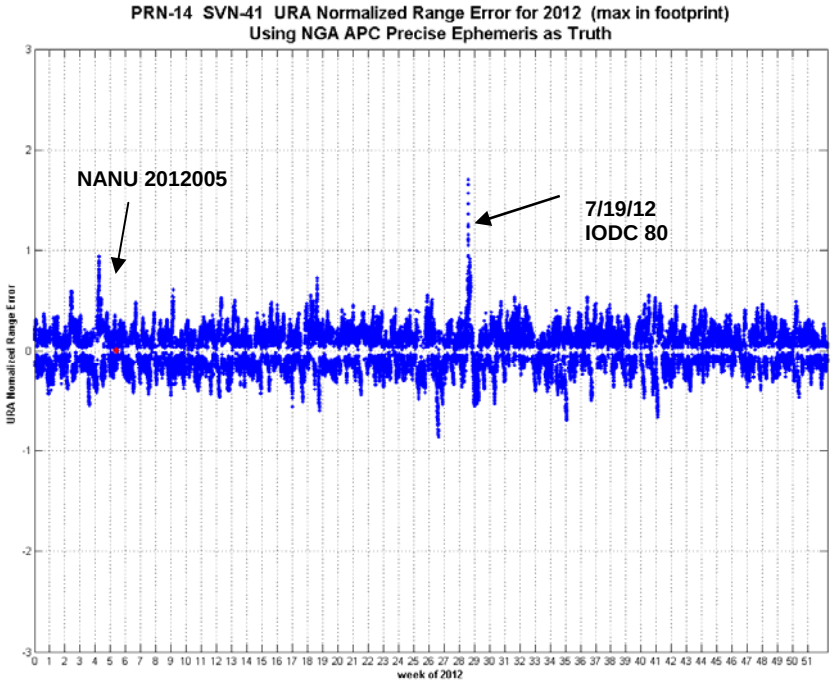


Figure 12-90 Timeline of URA Normalized Range Error PRN-15 SVN-55

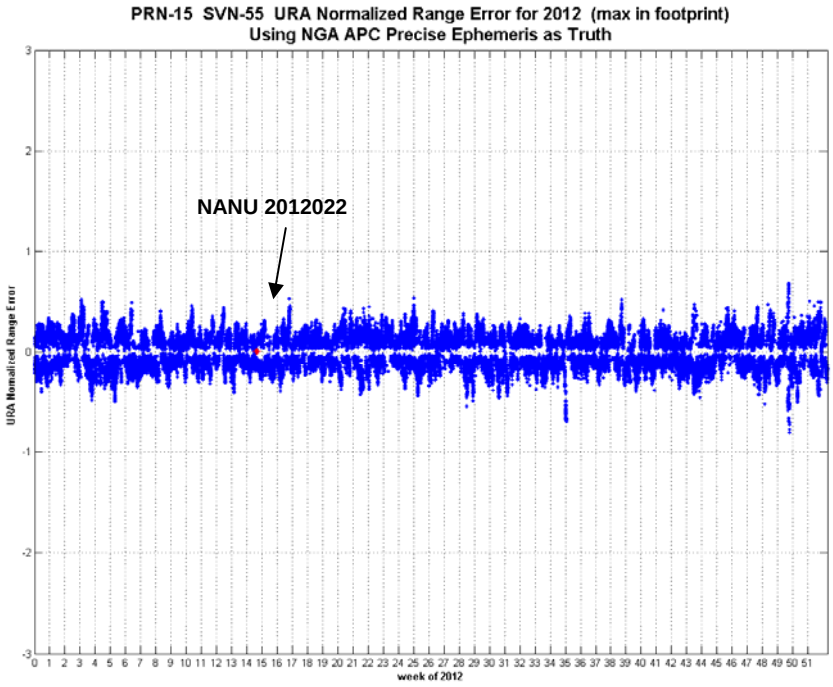


Figure 12-91 Timeline of URA Normalized Range Error PRN-16 SVN-56

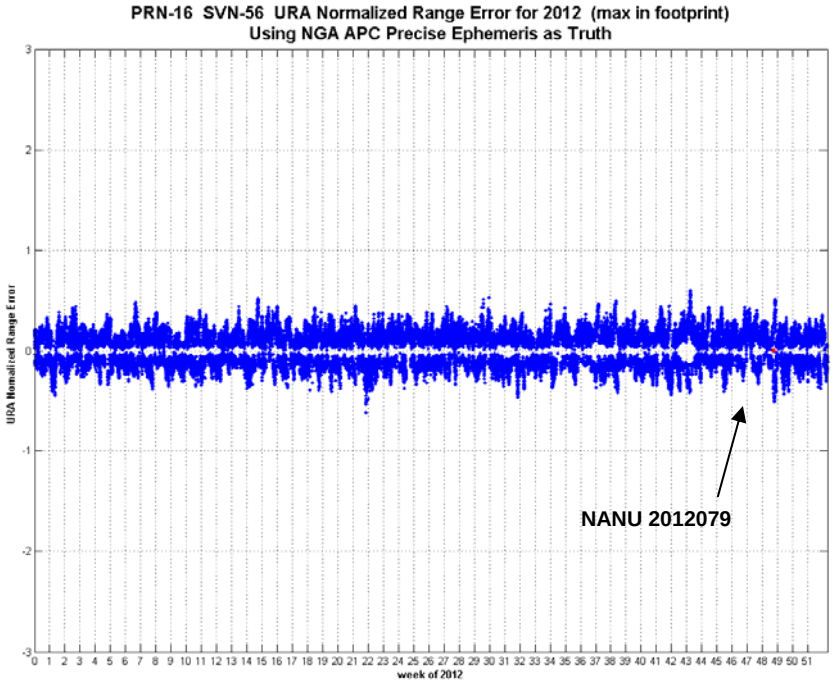


Figure 12-92 Timeline of URA Normalized Range Error PRN-17 SVN-53

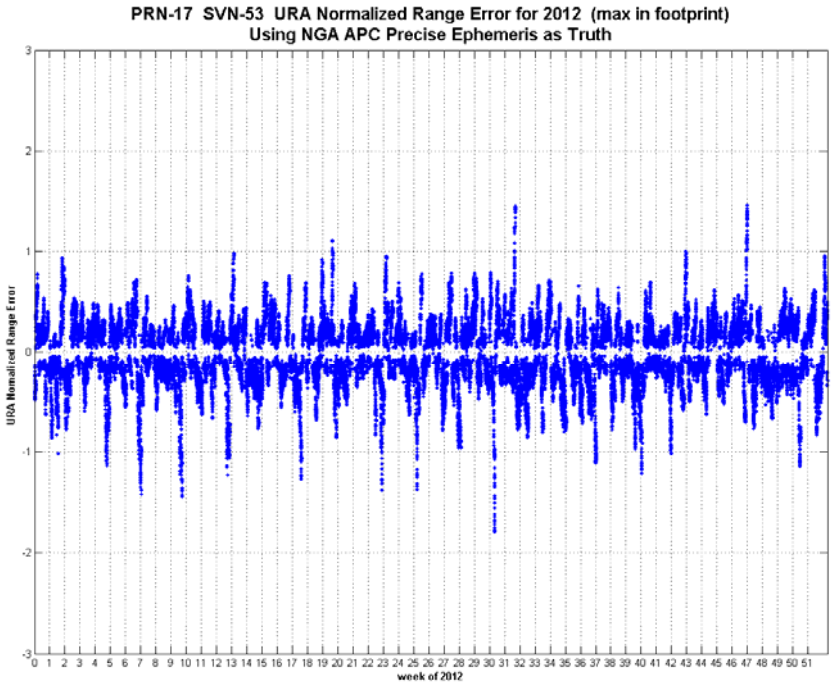
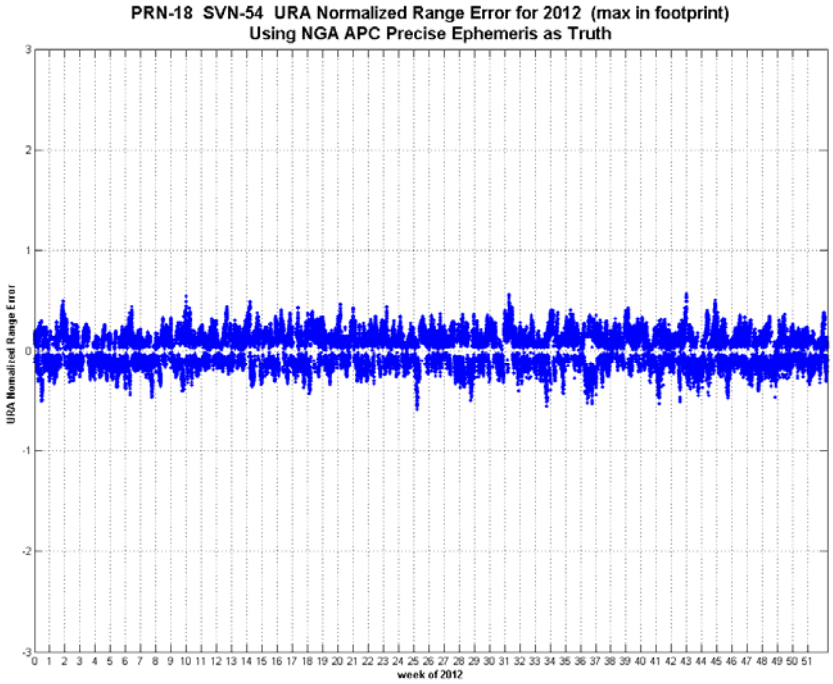


Figure 12-93 Timeline of URA Normalized Range Error PRN-18 SVN-54



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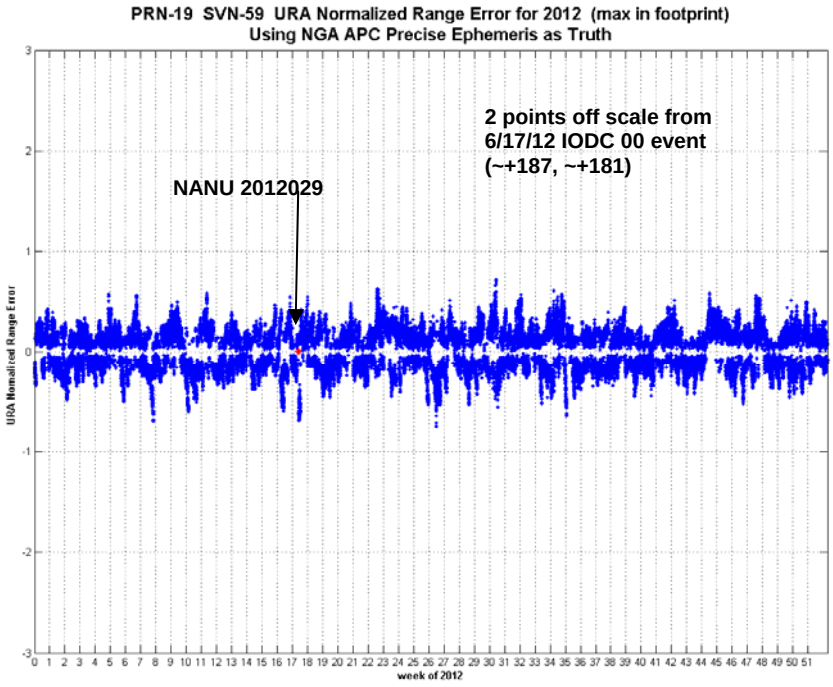


Figure 12-95 Timeline of URA Normalized Range Error PRN-20 SVN-51

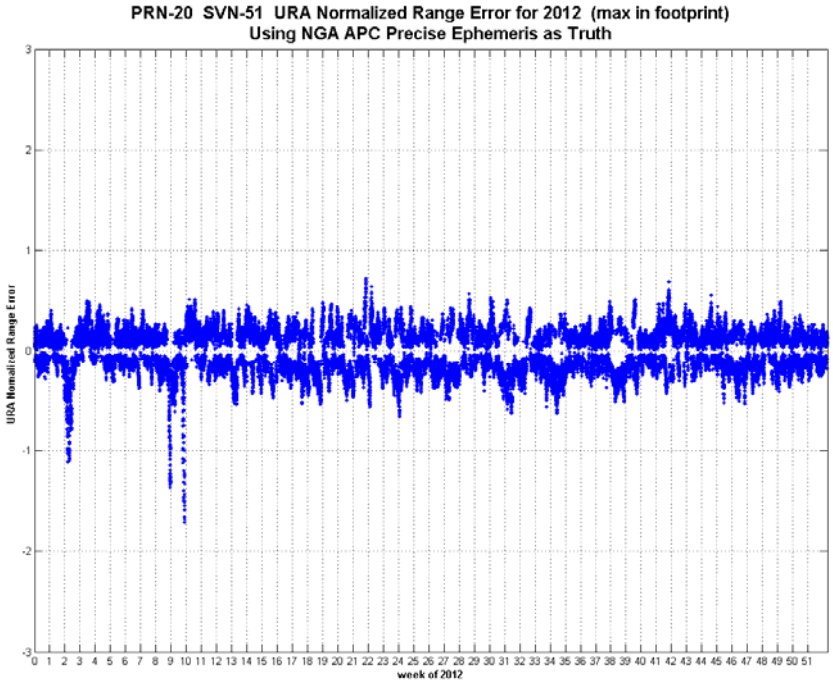


Figure 12-96 Timeline of URA Normalized Range Error PRN-21 SVN-45

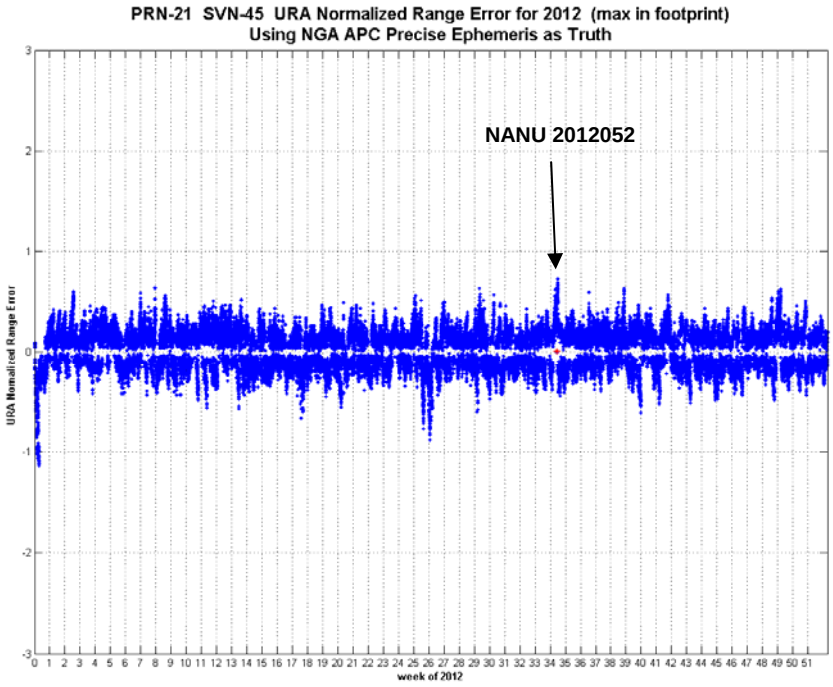


Figure 12-97 Timeline of URA Normalized Range Error PRN-22 SVN-47

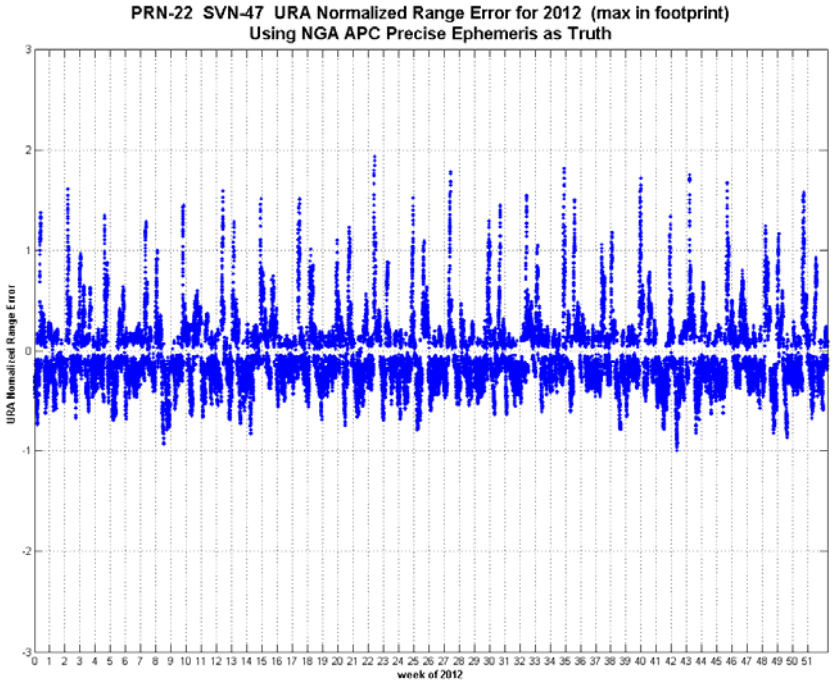


Figure 12-98 Timeline of URA Normalized Range Error PRN-23 SVN-60

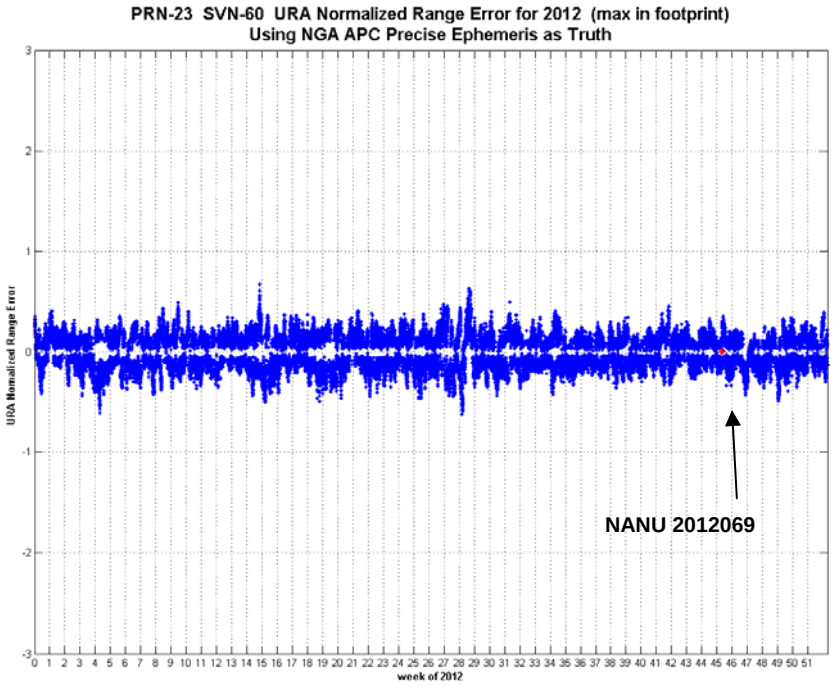


Figure 12-99 Timeline of URA Normalized Range Error PRN-24 SVN-24

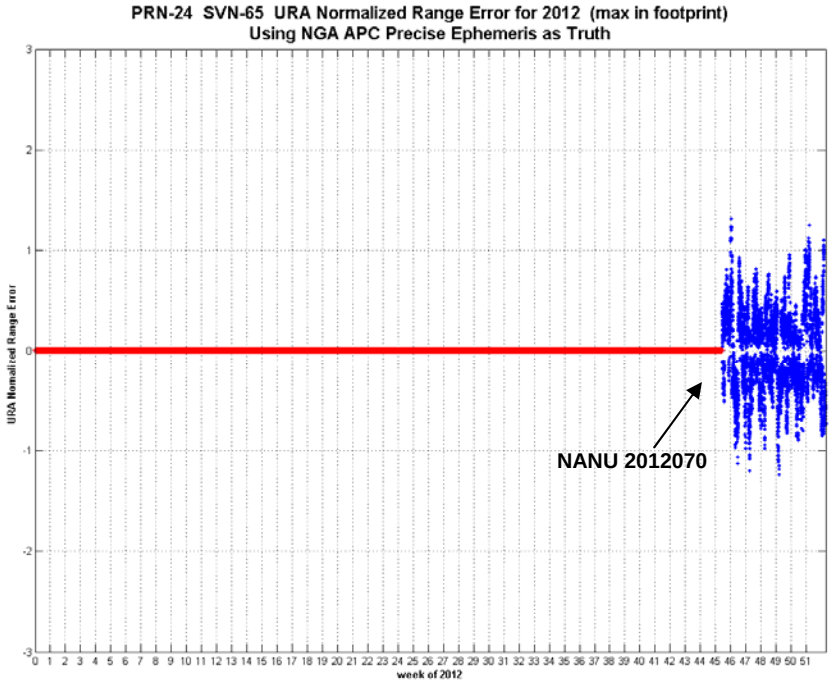


Figure 12-100 Timeline of URA Normalized Range Error PRN-25 SVN-62

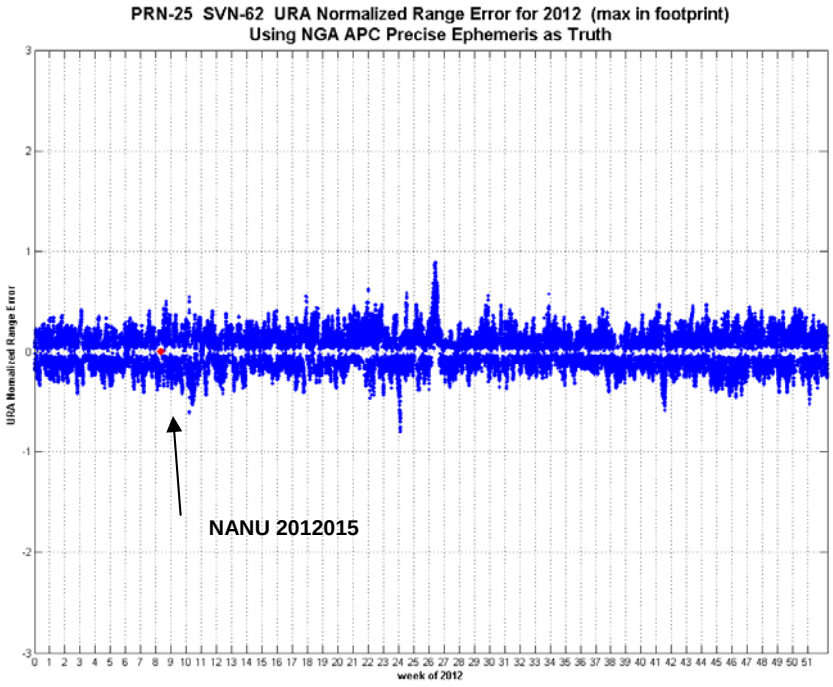


Figure 12-101 Timeline of URA Normalized Range Error PRN-26 SVN-26

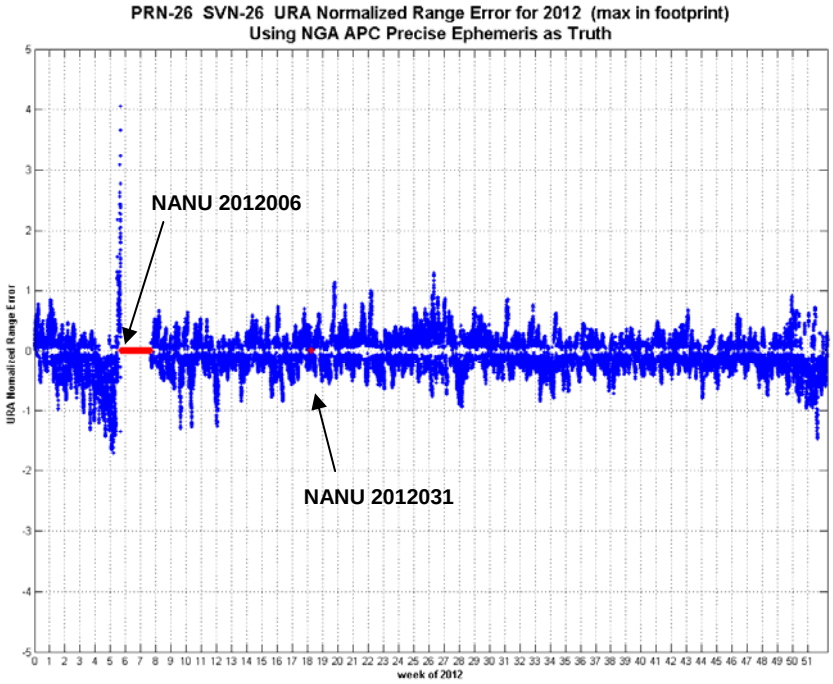


Figure 12-102 Timeline of URA Normalized Range Error PRN-27 SVN-27

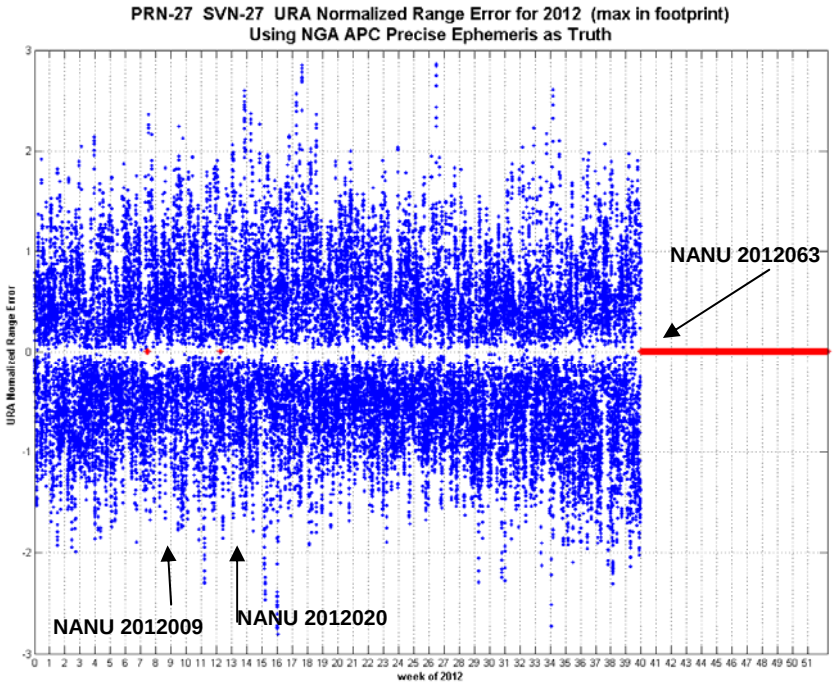


Figure 12-103 Timeline of URA Normalized Range Error PRN-28 SVN-44

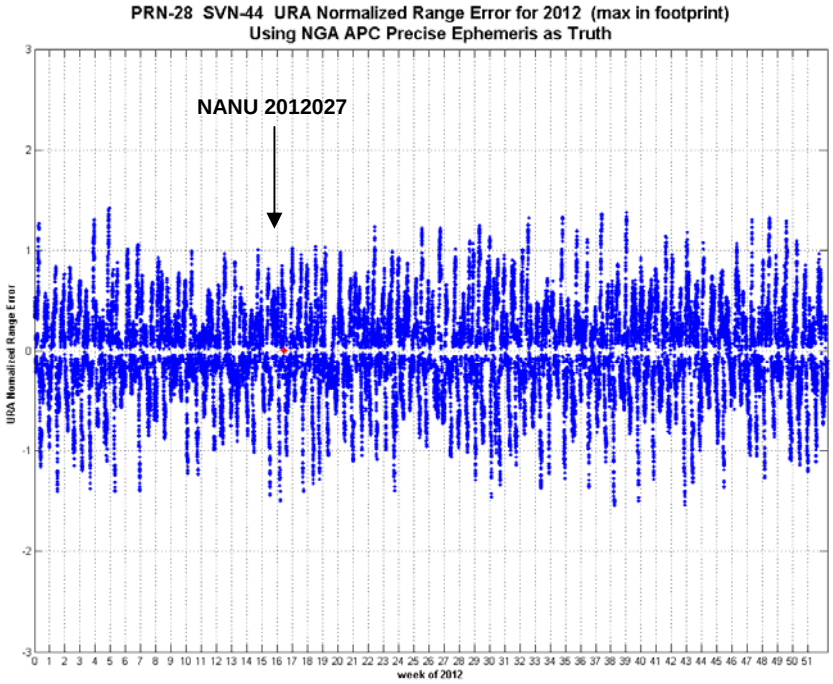


Figure 12-104 Timeline of URA Normalized Range Error PRN-29 SVN-57

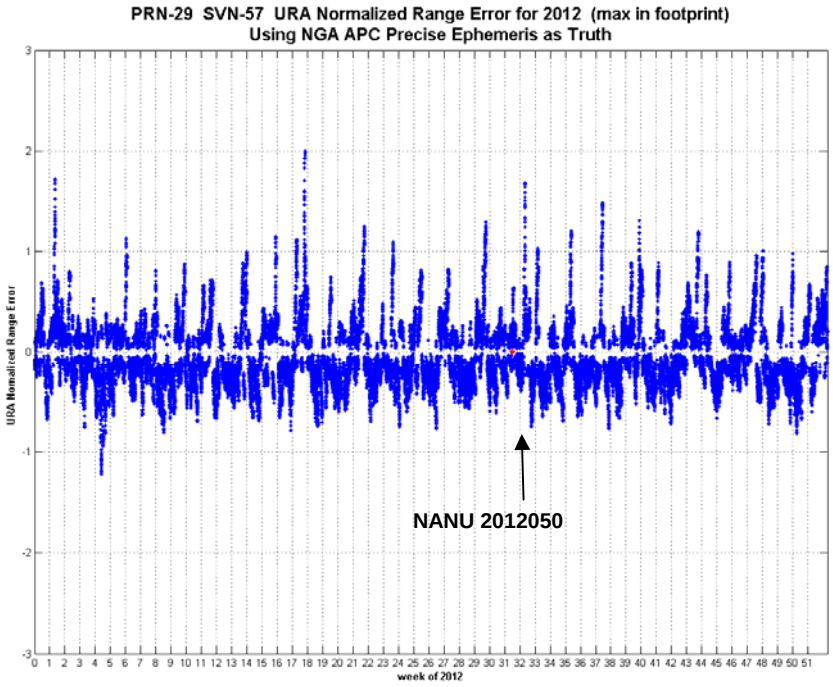


Figure 12-105 Timeline of URA Normalized Range Error PRN-30 SVN-35

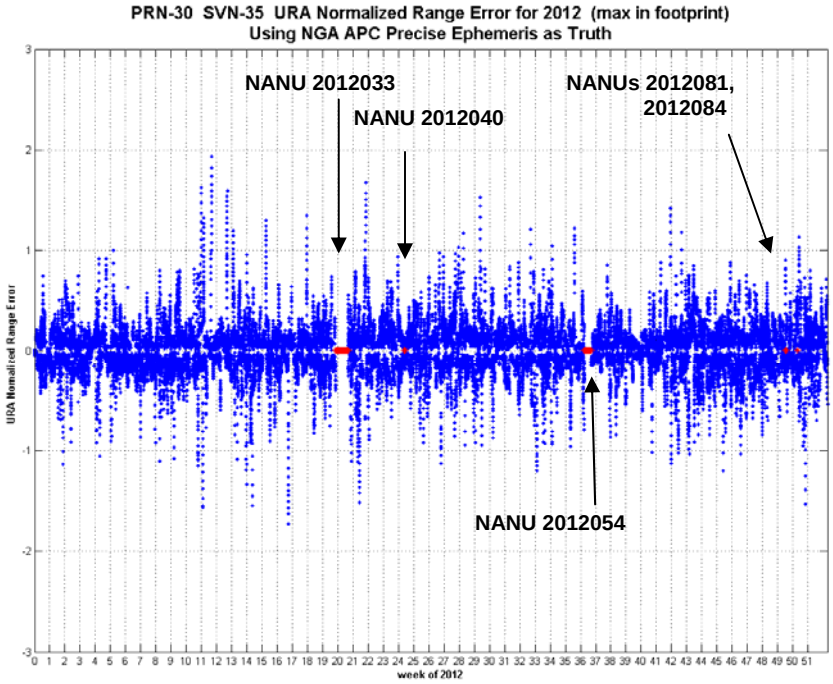


Figure 12-106 Timeline of URA Normalized Range Error PRN-31 SVN-52

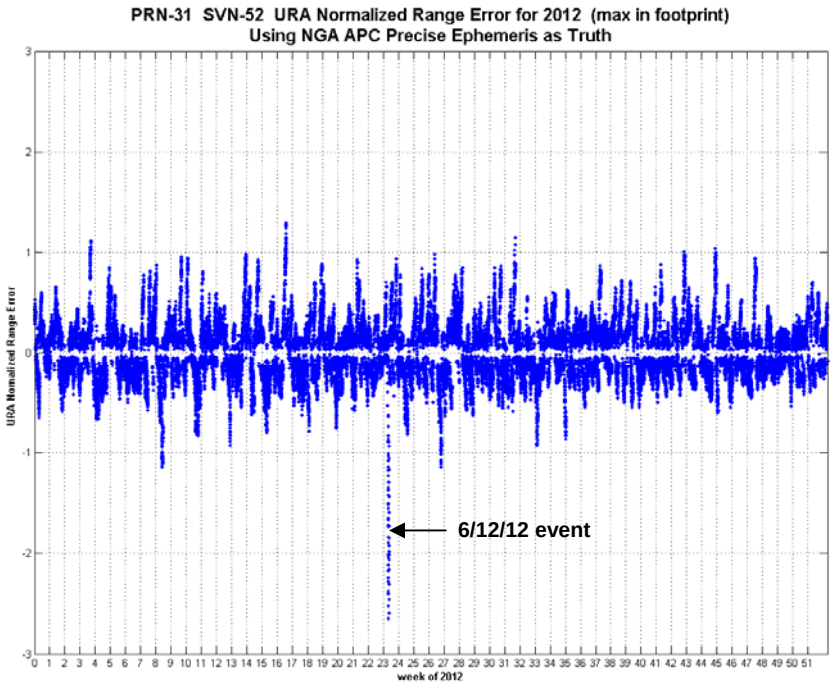
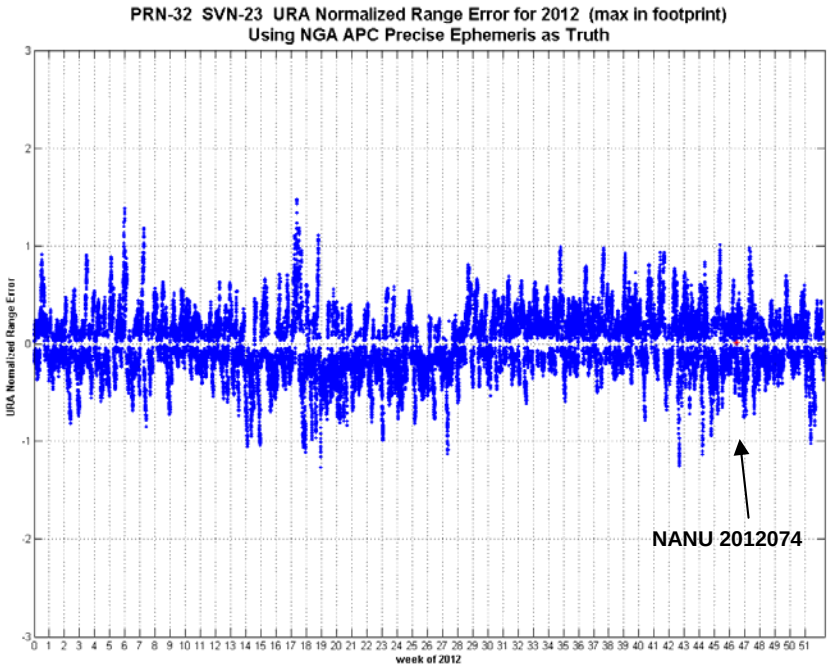


Figure 12-107 Timeline of URA Normalized Range Error PRN-32 SVN-23



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 Precision 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 for the Quarter

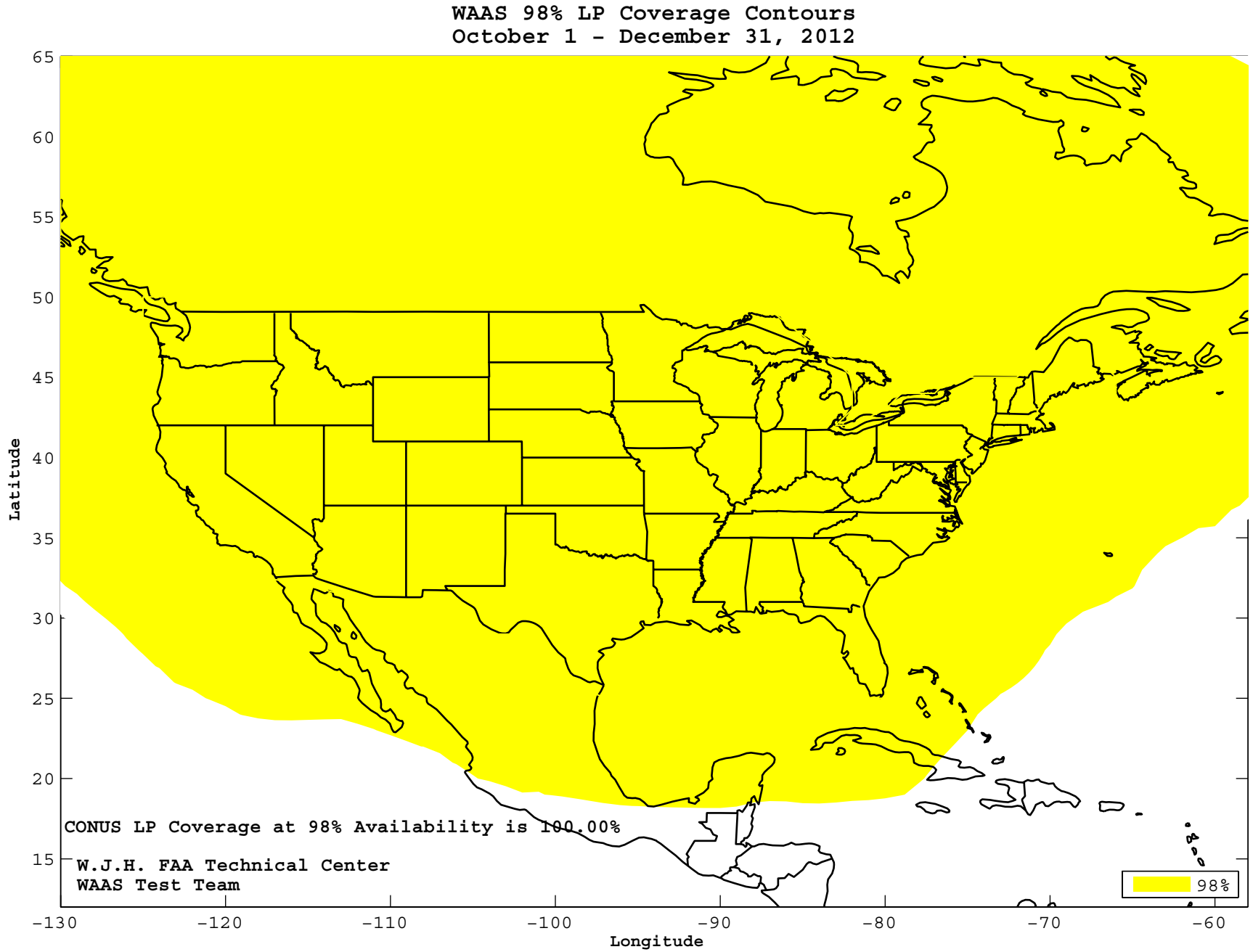


Figure B-2 98% Alaska LP Availability Contour for the Quarter

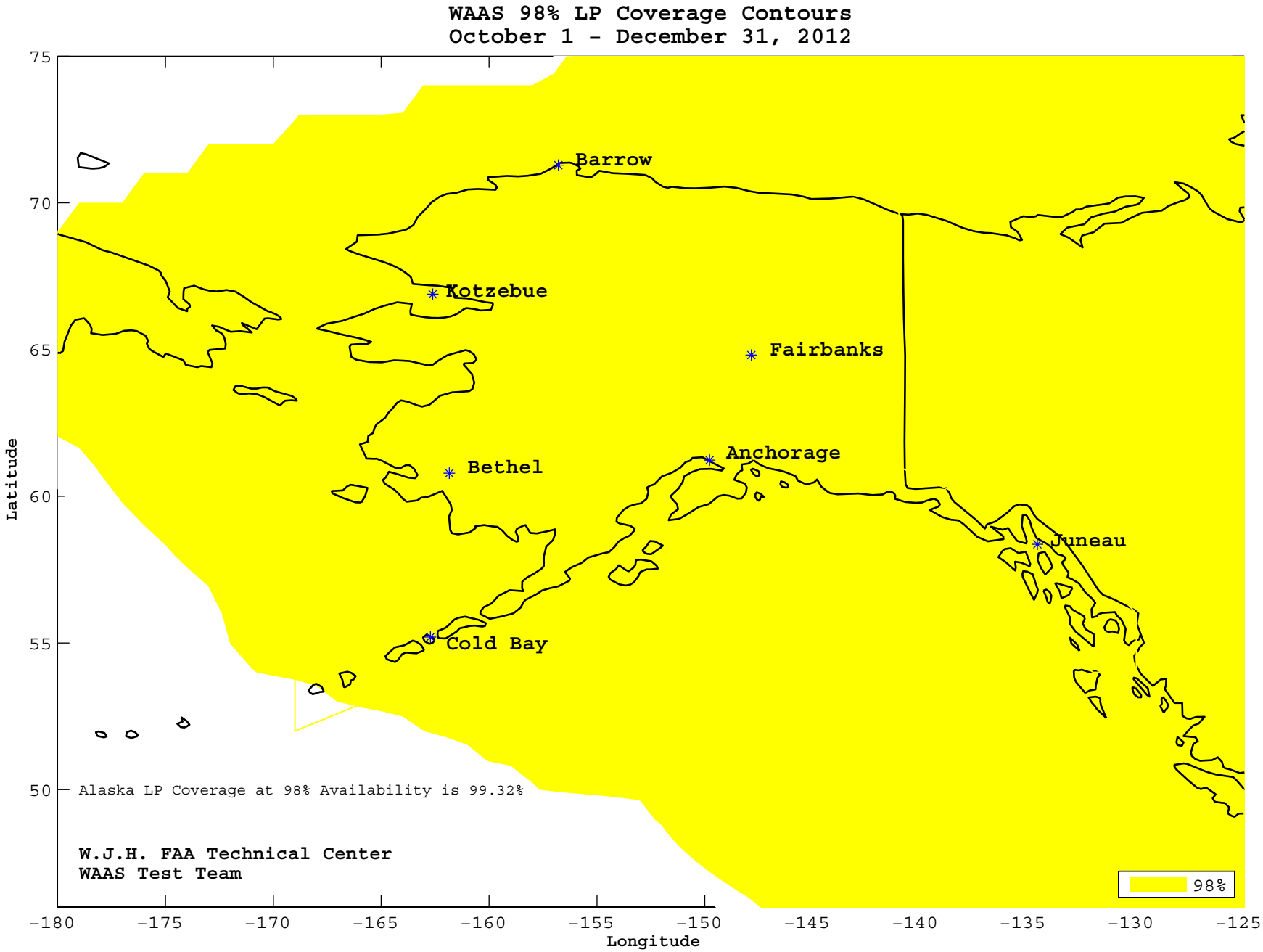


Figure B-3 98% CONUS LPV Availability Contour for the Quarter

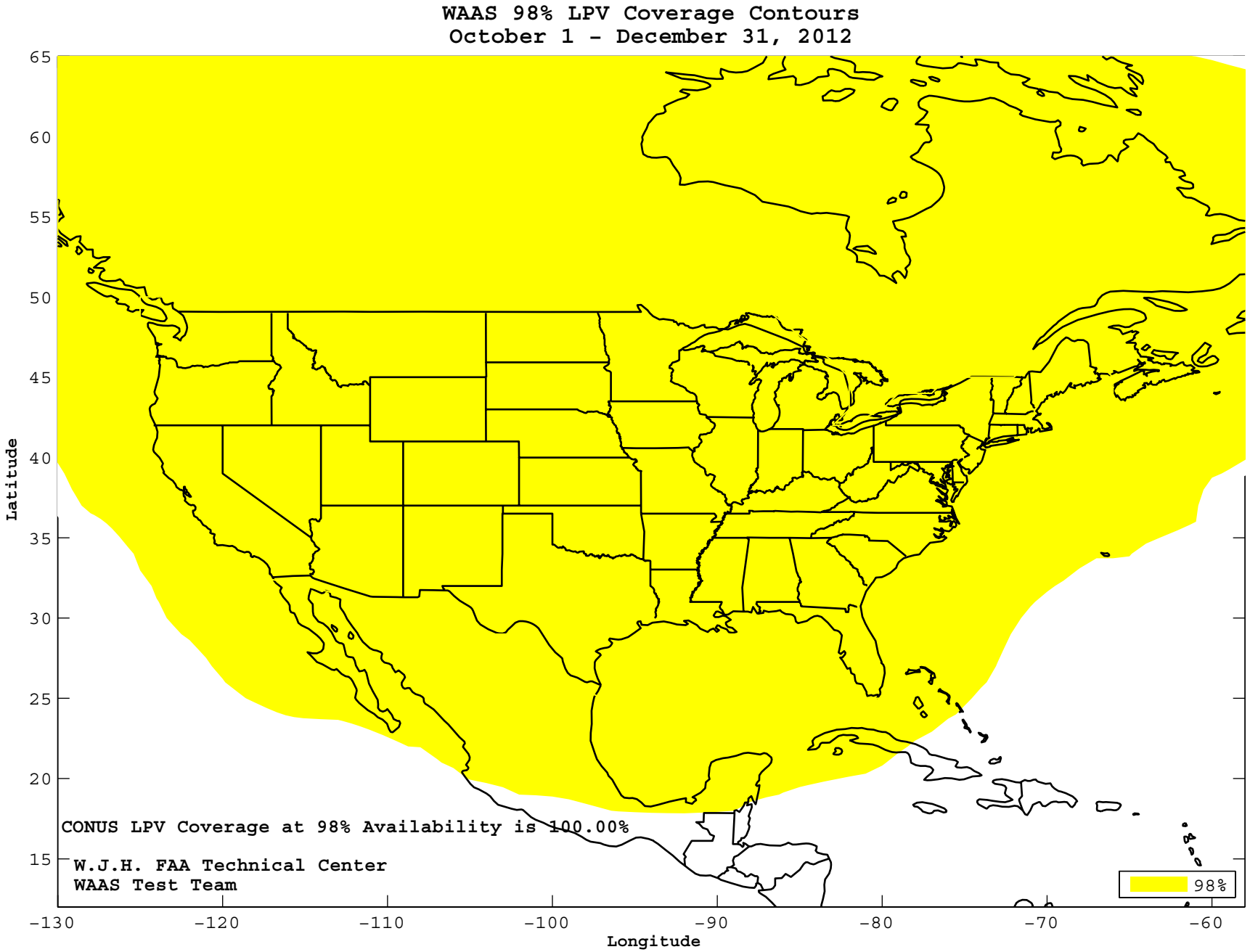


Figure B-4 98% Alaska LPV Availability Contour for the Quarter

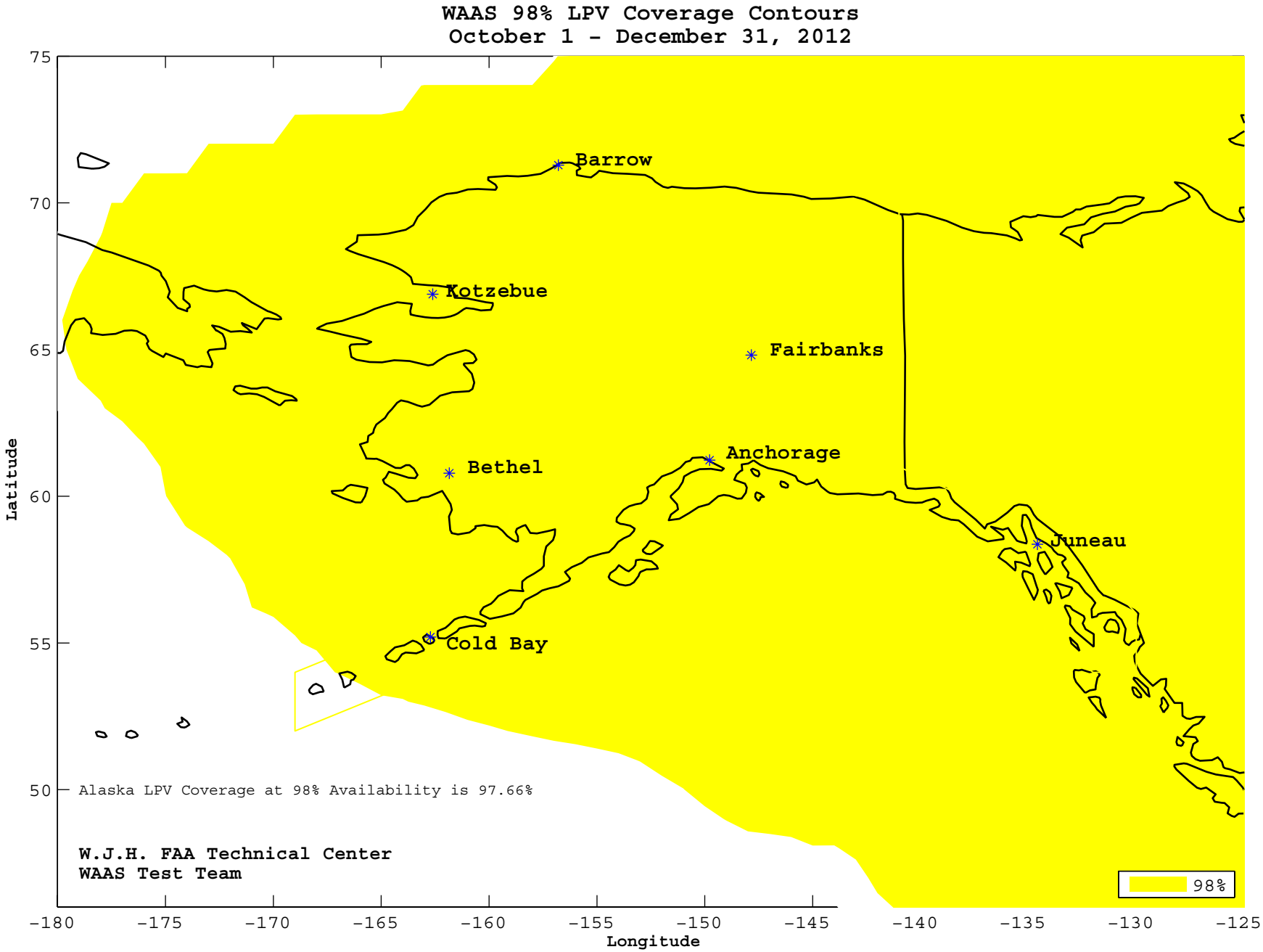


Figure B-5 99% CONUS LPV 200 Availability Contour for the Quarter

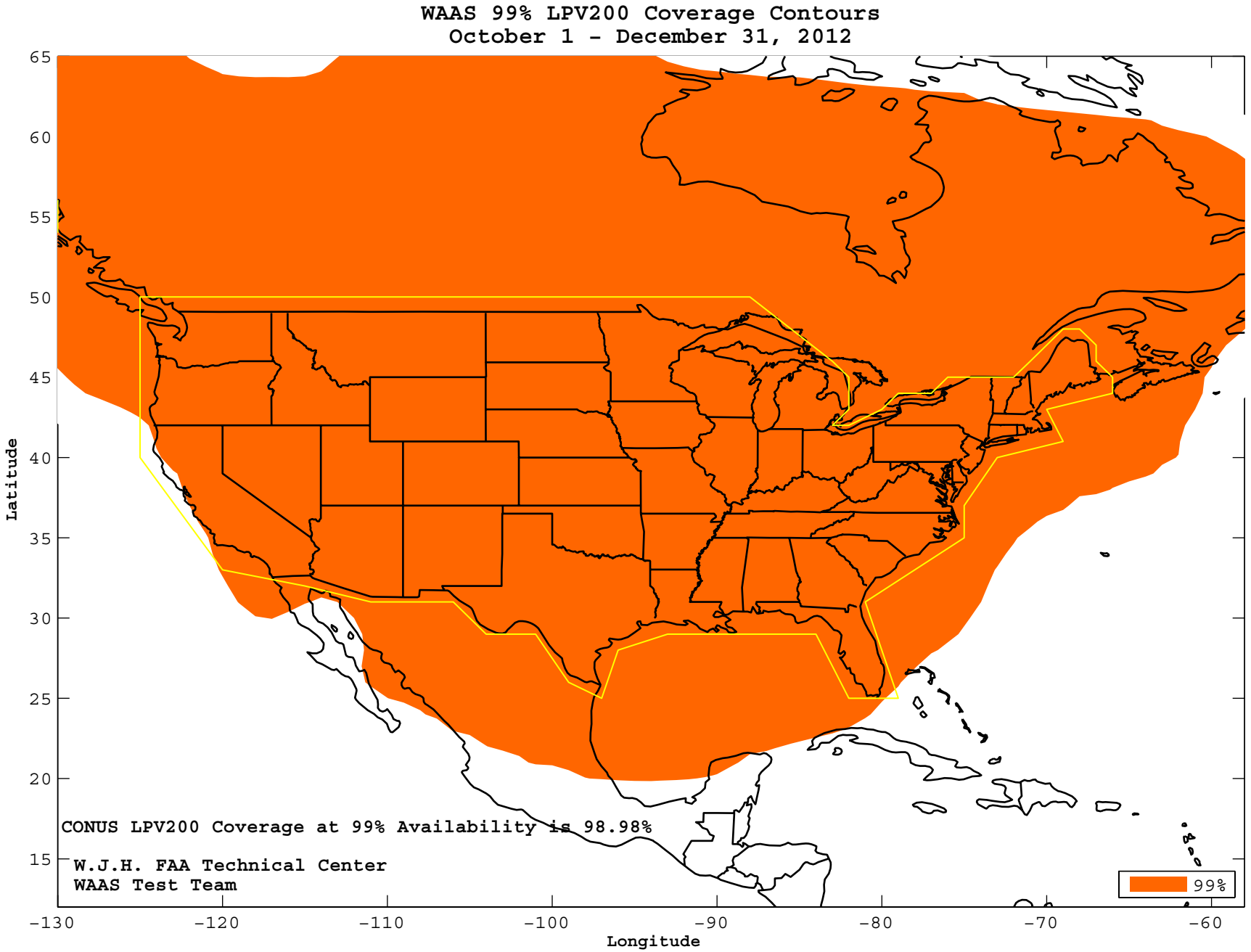


Figure B-6 99% Alaska LPV 200 Availability Contour for the Quarter