WIDE-AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #48

Reporting Period: January 1 to March 31, 2014

April 2014

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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 the GPS PAN report, the WAAS Test Team also reports on the performance of the Wide-Area Augmentation System (WAAS). This WAAS PAN report, Report #48, covers WAAS performance during the period from January 1, 2014 to March 31, 2014.

The report shows results in accuracy, availability, coverage, safety index, range accuracy, WAAS broadcast message rates, GEO ranging availability, WAAS airport availability, WAAS CNMP analysis, WAAS reference station survey validation, and SQM.

A section on G3 receiver performance is included in this report. Twelve Novatel WAAS G3 receivers were setup at six existing WAAS reference sites with two receivers at each site in October 2013. The WAAS system will be upgraded to G3 receivers in preparation for a full constellation of dual civil frequency GPS satellites (L1/L5). This is the first report showing results on G3 receiver performance.

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. LP service is available when the calculated Horizontal Protection Level (HPL) is less than 40 meters. LPV service is available when the calculated HPL is less than 40 meters and the Vertical Protection Level (VPL) is less than 50 meters. LPV 200 service is available when the calculated HPL is less than 40 meters, and the VPL is less than 35 meters. The NSTB sites, Grand Forks, Atlantic City, and Arcata, are outliers due to receiver quality issues, not the WAAS signal in space quality.

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Atlantic City 1.526 meters	Los Angeles 0.636 meters	Barrow 0.952 meters	Bethel 0.649 meters
95% Vertical Accuracy (VPL <= 50 meters)	Miami 1.867 meters	Denver 0.903 meters	Barrow 2.101 meters	Bethel 0.952 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Grand Forks 99.74%	Cold Bay 99.97%	Barrow 99.40%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Multiple Sites 100%	Grand Forks 99.74%	Cold Bay 99.91%	Barrow 99.22%
LPV 200 Availability (HPL <= 40 meters & VPL < =35 meters)	Multiple Sites 100%	Arcata 98.66%	Anchorage 99.65%	Cold Bay 94.83%
99% HPL	Arcata 17.759 meters	Memphis 11.314 meters	Cold Bay 29.771meters	Anchorage 16.204 meters
99% VPL	Arcata 36.301 meters	Kansas City 20.482 meters	Barrow 43.302 meters	Juneau 25.563 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

	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	55	4724503
Atlantic City	89	7670172
Grand Forks	86	7387890
Oklahoma City	78	6725702
WAAS:		
Albuquerque	90	7770270
Anchorage	90	7766991
Atlanta	90	7775863
Barrow	90	7751208
Bethel	90	7775269
Billings	89	7673220
Boston	90	7776000
Chicago	90	7775844
Cleveland	90	7767149
Cold Bay	90	7775557
Dallas	90	7759113
Denver	90	7769347
Fairbanks	90	7775831
Gander	90	7775590
Goose Bay	90	7771651
Houston	90	7745989
Iqaluit	90	7767367
Jacksonville	90	7776000
Juneau	90	7735574
Kansas City	90	7775861
Kotzebue	90	7775525
Los Angeles	90	7775982
Memphis	90	7771567
Merida	90	7767757
Mexico City	90	7736914
Miami	90	7768984
Minneapolis	90	7770374
New York	90	7775990
Oakland	90	7772953
Puerto Vallarta	90	7764003
Salt Lake City	90	7771054
San Jose Del Cabo	90	7774418
Seattle	90	7771065
Washington DC	90	7775741
Winnipeg	90	7768271

Table 1-3 NPA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
Albuquerque	90	7762098
Anchorage	90	7767389
Atlanta	90	7775931
Barrow	90	7763151
Bethel	90	7775272
Billings	90	7738857
Boston	90	7775917
Cleveland	90	7771150
Cold Bay	90	7775566
Fairbanks	90	7775925
Gander	90	7775990
Honolulu	90	7773603
Houston	90	7768239
Iqaluit	90	7767529
Juneau	90	7773679
Kansas City	90	7775993
Kotzebue	90	7775679
Los Angeles	90	7773836
Merida	90	7769026
Miami	90	7773292
Minneapolis	90	7766670
Oakland	90	7770452
Salt Lake City	90	7769540
San Jose Del Cabo	90	7775883
San Juan	90	7766231
Seattle	90	7757148
Tapachula	90	7760653
Washington DC	90	7773962

The report is divided in the performance categories listed below.

1. WAAS Position Accuracy
2. WAAS Operational Service Availability
3. WAAS Coverage
4. WAAS Integrity
5. WAAS Range Domain Accuracy
6. WAAS GEO Ranging Performance
7. WAAS Airport Availability
8. WAAS CNMP Analysis
9. WAAS Antenna Survey Validation
10. WAAS SQM Analysis
11. WAAS G3 Receiver 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
12/4/2013	2/3/2014	PRN1	CONUS	Starting on 12/4/13 through 2/3/14 (NANU 2014009), PRN-1 exhibited numerous carrier phase jerk anomalies of varying severity. Some events caused the carrier smoothing algorithm to reinitialize, others caused some or all of the WAAS receivers to loss lock and then reacquire PRN-1, which also reinitializes the carrier smoothing algorithm. The anomalies caused WAAS to alarm PRN-1 to the "not monitored" condition 15 to 25 times a day. The problem was resolved by maintenance being performed on the satellite. Some of the events caused minor LPV-200 outages to southern Florida. See DR 117.
1/1/2014	1/1/2014	Washington D.C. (CnV), Los Angeles (CnV),	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 4) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of the LPV-200

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
		Atlanta (CnV)		service in northern Canada and northern Alaska. The elevated GIVE values also enlarged the size of the brief daily outage that occurred in north western California, causing that outage to extend into Oregon and Washington state. Please see plot(s): LPV200_1/1/2014
1/3/2014	1/3/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	There was a small, brief outage of LPV-200 service spanning the border between North and South Dakota. PRN-1 was experiencing alerts in that time frame and is most likely the cause. Please see plot(s): LPV200_1/3/2014
1/4/2014	1/4/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	The size and duration of the daily LPV-200 outage in north western California was slightly larger and longer than normal. PRN-1 was experiencing alerts in the vicinity of that time period and was in a location critical to the IGPs which caused that daily outage. The GIVE values for those IGPs went to 15 meters due to the number and geometry of the satellites providing the ionosphere measurements. Outages had a higher duration than normal in California. This was due to SV Alerts on PRN 1 which occurred at the time of the daily outage in California. The SV alerts made the LPV200 outage in California last a bit longer than usual. Please see plot(s): LPV200_1/4/2014
1/7/2014	1/7/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Mild geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of the LPV-200 service in northern Canada. Please see plot(s): LPV200_1/7/2014
1/9/2014	1/10/2014	PRN19	LPV_CONUS, LPV200_CONUS	Planned maintenance on PRN-19 (NANU 2014002 Delta V maneuver) caused the temporary loss of services from that satellite which caused outages to the LPV and LPV-200 services along the west coast of CONUS on 1/9/14. Please see plot(s): LPV_1/9/2014 LPV200_1/9/2014
1/9/2014	1/9/2014	Boston (ZBW1), Boston (ZBW2), Boston (ZBW3)	Local	Local RFI caused the WAAS receivers at ZBW (Boston ARTCC, Nashua, New Hampshire) to briefly (~60 sec) lose tracking of enough GPS satellites to cause brief LPV and LPV-200 outages to be noted in this reported.
1/10/2014	1/10/2014	GEO133	None	Hardware problems at the Santa Paula uplink (SZP) for the AMR GEO, PRN-133, caused 17 WAAS user messages to have corrupted CRCs resulting in the loss of those messages. The message loss was sporadic over the day and worsening with time. The WAAS operators initiated a switch to the Paumalu Hawaii uplink site at 23:27:25 to allow maintenance to be performed at Santa Paula.

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
1/12/2014	1/12/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_CONUS, LPV200_Canada	Geomagnetic activity (Kp = 4) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of the LPV-200 service in northern central Canada and northeastern Alaska. Alerts on PRN-1 worsened the daily LPV-200 service outage to north western California. Please see plot(s): LPV200_1/12/2014
1/14/2014	1/14/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp = 4) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of the LPV-200 service in northern and central Canada. Alerts on PRN-1 worsened the daily LPV-200 service outage for the west coast, extending it north to the coast of Washington state. The ionosphere activity may have also contributed to the enlargement of that daily outage. Please see plot(s): LPV200_1/14/2014
1/15/2014	1/15/2014	PRN21	LPV_CONUS, LPV_Mexico, LPV200_CONUS, LPV200_Mexico	PRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused a small, brief LPV outage to the west coast and degraded LPV in southern Mexico. It also caused a short, but wide spread LPV-200 service outage impacting southwestern CONUS, southern Texas, Nevada, Idaho, and Mexico. Please see plot(s): LPV_1/15/2014 LPV200_1/15/2014
1/15/2014	1/15/2014	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	LPV200_Canada	Overlapping communications outages to both networks to the Goose Bay Canada resulted in the temporary loss of service from that reference station which degraded performance and degraded LPV-200 service coverage to eastern Canada. Please see plot(s): LPV200_1/15/2014
1/16/2014	1/16/2014	PRN22	LPV_CONUS, LPV200_CONUS, LPV200_Canada	Planned maintenance on PRN-22 (NANU 2014004 Delta V maneuver) caused the temporary loss of services from that satellite which caused outages to the LPV and LPV-200 services along the west coast of CONUS. Please see plot(s): LPV_1/16/2014 LPV200_1/16/2014
1/21/2014	1/21/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Mild geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of the LPV-200 service in northern Canada and north western Alaska. There was also a small degradation of the LPV service along the northern edge of coverage for north western Canada. Please see plot(s): LPV_1/21/2014 LPV200_1/21/2014

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
1/28/2014	1/28/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (Kp = 2) disturbed the ionosphere causing the WAAS ionosphere irregularity detector to trigger for 8 IGPs, setting the GIVE values for those IGPs to 45 meters. This caused a significant degradation to the LPV-200 service for northern Canada and a small degradation to the LPV service along the north eastern edge of Canada. Alerts on PRN-1 worsened the daily LPV-200 service outage for the west coast, extending it north to the coast of Washington state. Please see plot(s): LPV_1/28/2014 LPV200_1/28/2014
1/31/2014	1/31/2014	PRN21	LPV_Canada, LPV200_CONUS, LPV200_Canada	PPRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused a small, brief LPV service outage to the eastern tip of Canada. It also caused a widespread, but brief (~ 6 minute) LPV-200 service outage to eastern Canada and north eastern CONUS. Please see plot(s): LPV_1/31/2014 LPV200_1/31/2014
2/1/2014	2/1/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Mild geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of the LPV-200 service in northern Canada and north eastern Canada. Please see plot(s): LPV200_2/1/2014
2/3/2014	2/3/2014	PRN1	None	Planned maintenance for PRN-1 (NANU 2014009). This maintenance corrected the issue that was causing numerous alerts for PRN-1.
2/6/2014	2/6/2014	PRN21	LPV_Canada, LPV200_Alaska, LPV200_Canada	PRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused a brief LPV outage in Canada and brief outages to the LPV-200 service in Alaska and Canada. Please see plot(s): LPV_2/6/2014 LPV200_2/6/2014
2/6/2014	2/8/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity over the three day period from 2/6/14 to 2/8/14 resulted in disturbances to the ionosphere which resulted in elevated GIVE values. The Kp values were 3, 4, and 5 respectively for the 3 days. The high GIVE values caused outages to the LPV and LPV-200 services in Canada for all three days and in Alaska on 2/8/14. During the same period a carrier phase

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				glitch on PRN-21 on 2/6/14 and planned maintenance on PRN-21 on 2/7/14 caused more severe outages which dominate the plots. Please see plot(s): LPV_2/6/2014 LPV200_2/6/2014 LPV_2/7/2014 LPV200_2/7/2014 LPV_2/8/2014 LPV200_2/8/2014
2/7/2014	2/7/2014	PRN21	LPV_CONUS, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Planned maintenance on PRN-21 (NANU 2014011 Delta V maneuver) caused the temporary loss of services from that satellite which caused LPV service outages to CONUS and western Canada and LPV-200 service outages to CONUS, Alaska, and Canada. Please see plot(s): LPV_2/7/2014 LPV200_2/7/2014
2/9/2014	2/9/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (Kp = 4) from 18:00Z to 24:00Z caused the ionosphere to be disturbed which resulted in elevated GIVE values, which in turn caused outages to the LPV and LPV200 services Canada. During this same period there were simultaneous outages on both networks to the Goose Bay Canada (YYR) reference station (network A had been offline the entire day). The loss of ionospheric measurement data from Goose Bay contributed to several IGPs being set to "Not Monitored" which also contributed to the LPV and LPV-200 service outages in eastern Canada. Please see plot(s): LPV_2/9/2014 LPV200_2/9/2014
2/9/2014	2/9/2014	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	LPV_Canada, LPV200_Canada	The Goose Bay Canada (YYR) reference station was offline due simultaneous maintenance (or comm outages) on both the B and C threads of equipment. The A thread was offline the entire day. Loss of services from the YYR reference station contributed to several IGPs being set to "Not Monitored" / having higher than normal GIVE values. Along with elevated GIVE values caused by ionosphere disturbances, this contributed to the LPV and LPV-200 service outages in Canada. Please see plot(s): LPV_2/9/2014 LPV200_2/9/2014
2/10/2014	2/10/2014	PRN138	LPV_Canada, LPV200_Canada	The CRE GEO, PRN-138 was alarmed to "Do Not Use" for ranging due to a Code Carrier Coherency monitor trip. Corrections data link services were not impacted. The temporary loss of ranging services from PRN-138 contributed to LPV and LPV-200 service outages in Canada. The cause of the CCC monitor trip was isolated to degradation to the L-Band dish antenna element feed caused by very heavy snow fall at the Brewster Washington uplink site Please see plot(s): LPV_2/10/2014

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				LPV200_2/10/2014
2/10/2014	2/12/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity over the three day period from 2/10/14 to 2/12/14 resulted in disturbances to the ionosphere which resulted in elevated GIVE values. The Kp values were 4, 3, and 3 respectively for the 3 days. During the same period there were additional issues that contributed to service outages that are documented in following events, i.e. CRE GEO (PRN-138) problems on 2/10/14, Goose Bay maintenance issues on 2/12/14, and uplink switch for the CRE GEO on 2/12/14. Please see plot(s): LPV200_2/10/2014
2/11/2014	2/11/2014	Goose Bay (YYR1), Goose Bay (YYR2)	LPV_Canada, LPV200_Canada	The Goose Bay Canada (YYR) reference station was offline due simultaneous maintenance on both the B and C threads of equipment. The A thread was offline the entire day. Loss of services from the YYR reference station contributed to several IGPs being set to "Not Monitored" / having higher than normal GIVE values. Along with elevated GIVE values caused by ionosphere disturbances, this contributed to the LPV and LPV-200 service outages in Canada. Please see plot(s): LPV_2/11/2014 LPV200_2/11/2014
2/12/2014	2/12/2014	GEO138,Woodbine (QWE)	LPV_Canada, LPV200_Alaska, LPV200_Canada	There were 3 events for the CRE GEO, PRN-138 on 2/12/14: 1) PRN-138 was alarmed to "Do Not Use" for ranging from 09:44Z to 11:15Z due to the WAAS code to carrier coherency (CCC) monitor tripping for that ranging signal, 2) there was an automatic uplink switch for the CRE GEO from the Brewster WA uplink to the Woodbine MD uplink at 12:42Z due to the Brewster uplink faulting, and 3) there was an operator initiated uplink switch for CRE from Woodbine back to Brewster at 20:30Z. The cause of the failure at Brewster was snow damage to the antenna element feed of the L-band downlink dish. These events resulted in high UDRE's for the CRE, PRN-138, ranging signal which contributed to the LPV and LPV-200 service outages in Canada and the LPV-200 service outages in Alaska. Please see plot(s): LPV_2/12/2014 LPV200_2/12/2014
2/12/2014	2/12/2014	PRN21	LPV_Canada, LPV200_CONUS, LPV200_Canada	PRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused a LPV and LPV-200 service outages in Canada and a LPV-200 service outage in CONUS. Please see plot(s): LPV_2/12/2014

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				LPV200_2/12/2014
2/14/2014	2/14/2014	PRN138	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	PRN-138 was alarmed to "Do Not Use" for ranging from 12:58Z to 16:54Z due to the WAAS code to carrier coherency (CCC) monitor tripping for that ranging signal. The corrections data link functionality for CRE was not impacted. The elevated UDREs for PRN-138 along with maintenance on PRN-2 contributed to LPV-200 service outages in Canada, Alaska, CONUS, and Mexico. Please see plot(s): LPV200_2/14/2014
2/14/2014	2/14/2014	PRN2	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Planned maintenance on PRN-2 (NANU 2014014 Delta V maneuver) caused the temporary loss of services from that satellite which combined with the high UDREs on PRN-138, caused LPV-200 service outages to CONUS, Alaska, Canada, and Mexico. Please see plot(s): LPV200_2/14/2014
2/15/2014	2/15/2014	PRN138	LPV_Canada, LPV200_Canada	PRN-138 was alarmed to "Do Not Use" for ranging from 23:01Z to 23:26Z due to the WAAS code to carrier coherency (CCC) monitor tripping for that ranging signal. The corrections data link functionality for CRE was not impacted. The elevated UDREs for PRN-138 along with elevated GIVEs from the disturbed ionosphere resulted in degraded LPV and LPV-200 service coverage in northern Canada. Please see plot(s): LPV_2/15/2014 LPV200_2/15/2014
2/15/2014	2/17/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity over the three day period from 2/15/14 to 2/17/14 resulted in disturbances to the ionosphere which resulted in elevated GIVE values. The Kp values were 5, 5, and 3 respectively for the 3 days. In addition high UDREs on PRN-135 on 2/16/14 from residual over threshold trips for the internal UDRE monitor and high UDREs on PRN-138 from the CCC monitor trip on 2/15/14 contributed to the degradation of the LPV and LPV-200 service. On 2/16/14 LPV-200 service was degraded in Alaska, Canada, and a small region of COUNS (VA, PA, and MD) and LPV service was degraded in northern Alaska and northern Canada. On 2/17/14 LPV-200 was slightly degraded in northern Canada. On 2/15/14 LPV-200 service was degraded in northern and central Canada, northern Alaska, and the coast of Oregon, Washington, and northern California, and LPV services as degraded on the northern edge of Canadian coverage. Please see plot(s): LPV_2/15/2014 LPV200_2/15/2014
2/16/2014	2/16/2014	PRN138	All	PRN-138 was alarmed to "Do Not Use" for

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				ranging from 00:11Z to 06:17Z due to the WAAS code to carrier coherency (CCC) monitor tripping for that ranging signal. The corrections data link functionality for CRE was not impacted. The elevated UDREs for PRN-138 along with elevated GIVEs from the disturbed ionosphere resulted in degraded LPV and LPV-200 service coverage. Please see plot(s): LPV_2/16/2014 LPV200_2/16/2014
2/18/2014	2/19/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Strong geomagnetic activity on 2/18/14 (Kp = 3) and 2/19/15 (Kp = 6) disturbed the ionosphere, resulting in the WAAS ionosphere irregularity detector tripping for a large number of IGPs, setting those GIVE values to 45 meters. This resulted in significant LPV and LPV-200 service outages across Canada and Alaska on both days and a small degradation to LPV-200 coverage in north central CONUS on 2/18/14. Please see plot(s): LPV_2/18/2014 LPV200_2/18/2014 LPV_2/19/2014 LPV200_2/19/2014
2/18/2014	2/18/2014	PRN16	LPV200_Alaska	Planned maintenance on PRN-16 (NANU 2014016 Delta V maneuver) caused the temporary loss of services from that satellite which caused a brief (~ 2 minute) LPV-200 service outage in the vicinity of Cold Bay Alaska. Please see plot(s): LPV200_2/18/2014
2/20/2014	2/20/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused outages of the LPV-200 service in northern Canada. Please see plot(s): LPV200_2/20/2014
2/21/2014	2/21/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused outages of the LPV-200 service in northern Canada and northern Alaska, and outages to the LPV service in north eastern Canada. Please see plot(s): LPV_2/21/2014 LPV200_2/21/2014
2/21/2014	2/21/2014	PRN6	None	SVN-36 (IIA) was decommissioned and PRN-6 designation was removed from that satellite.
2/22/2014	2/22/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 4) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused outages of the LPV-200 service in northern and central Canada and northern Alaska. Please see plot(s): LPV200_2/22/2014
2/23/2014	2/23/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 4) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused significant outages of the LPV and LPV-200 service in most of Canada.

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				It also caused LPV and LPV-200 service outages to northern central CONUS, and LPV-200 service outages to Alaska. Please see plot(s): LPV_2/23/2014 LPV200_2/23/2014
2/24/2014	2/26/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity over the three day period from 2/24/14 to 2/26/14 resulted in disturbances to the ionosphere which resulted in elevated GIVE values. The Kp values were 3, 2, and 3 respectively for the 3 days. The elevated GIVE values caused degradation of the LPV-200 service in northern Alaska and Canada for all three days, degradation of the LPV service in northern Canada for all three days, an degradation of the LPV-200 service in northern Alaska on 2/25/14. Please see plot(s): LPV_2/24/2014 LPV200_2/24/2014 LPV_2/25/2014 LPV200_2/25/2014 LPV_2/26/2014 LPV200_2/26/2014
2/26/2014	2/26/2014	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	A 10 minute communications outage on both networks to the Iqaluit Canada reference station (YFB) resulted in the temporary loss of measurement data from that site. This contributed to the LPV and LPV-200 service outages in northern Canada on this day. Please see plot(s): LPV_2/26/2014 LPV200_2/26/2014
2/26/2014	2/26/2014	Kotzebue (OTZ1), Kotzebue (OTZ2), Kotzebue (OTZ3)	LPV200_Alaska	There were several short communications outages to several of the Alaskan reference stations that correlated with brief LPV-200 service outages in Alaska. The communications dropouts are related to the effects of scintillation on the satellite communications links. These communications outages resulted in higher GIVE values because of the loss of ionospheric measurements. The 20 minute outage at 07:23 was the result of short dropouts of the links to Fairbanks, Bethel, Kotzebue, and Barrow near that time, and another outage at 17:12 was caused by a communications outage to Kotzebue. Please see plot(s): LPV200_2/26/2014
2/27/2014	2/28/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	All	Strong geomagnetic activity on 2/27/14 (Kp = 6) and 2/28/14 (Kp = 4) disturbed the ionosphere, resulting in the WAAS ionosphere irregularity detector tripping for a large number of IGPs, setting those GIVE values to 45 meters. This resulted in major LPV and LPV-200 service for CONUS, Alaska, and Canada for both days. Please see plot(s): LPV_2/27/2014 LPV200_2/27/2014 LPV_2/28/2014 LPV200_2/28/2014
2/28/2014	2/28/2014	Iqaluit (YFB1),	LPV_Canada,	Approximately 1400 seconds of communications

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		Iqaluit (YFB2), Iqaluit (YFB3)	LPV200_Canada	outage on both networks to the Iqaluit Canada reference station (YFB) resulted in the temporary loss of measurement data from that site. This contributed to the LPV and LPV-200 service outages in northern Canada on this day. Please see plot(s): LPV_2/28/2014 LPV200_2/28/2014
3/1/2014	3/3/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused outages of the LPV and LPV-200 service in northern Canada. It also caused LPV-200 service outages to northern Alaska.
3/4/2014	3/5/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3 on both days) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused outages of the LPV and LPV-200 service in northern Canada and northern Alaska on 3/4/14, and LPV-200 service outages to northern Canada and northern Alaska on 3/5/14. Please see plot(s): LPV_3/4/2014 LPV200_3/4/2014 LPV200_3/5/2014
3/5/2014	3/5/2014	PRN32	LPV200_Canada	PRN-32 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-32 to be re-initialized. This caused the temporary loss of service from PRN-32 as the smoothing algorithm settled. This caused LPV-200 service outages in north east Canada for about 20 minutes starting at 20:08Z. Please see plot(s): LPV200_3/5/2014
3/5/2014	3/5/2014	PRN5	LPV200_Alaska	Planned maintenance on PRN-5 (NANU 2014023 Delta V maneuver) caused the temporary loss of services from that satellite which contributed to degradation of the LPV-200 service in northern Alaska. Please see plot(s): LPV200_3/5/2014
3/6/2014	3/6/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of the LPV-200 service in northern Canada and northern Alaska. The glitch on PRN-25 and the maintenance on PRN-17 also contributed to the LPV-200 service outages in Alaska. See DR 121. Please see plot(s): LPV200_3/6/2014
3/7/2014	3/7/2014	PRN17	LPV200_All	The reduction in CONUS coverage was due to a GPS NANU on PRN 17, which was unusable from 03:55 GMT to 09:46 GMT on March 7, 2014. The NANU caused a loss of LPV and LPV200 service in Northeastern CONUS and a loss of LPV200 coverage in western CONUS. The reduction in Alaska coverage was caused by an SV Alert on

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				PRN 25, which occurred at 09:25 GMT. The SV Alert reduced LPV200 coverage in Alaska for about 10 minutes. Geomagnetic activity had a negligible effect on coverage. Please see plot(s): LPV200_3/7/2014
3/7/2014	3/7/2014	PRN25	LPV_Alaska, LPV200_Alaska	PRN-25 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-25 to be re-initialized. This caused the temporary loss of service from PRN-25 as the smoothing algorithm settled. This caused LPV-200 service outages in western Alaska for about 20 minutes starting at 09:25Z. Please see plot(s): LPV200_3/7/2014
3/10/2014	3/10/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of both the LPV and LPV-200 services in western Canada and northern Alaska. Please see plot(s): LPV_3/10/2014 LPV200_3/10/2014
3/10/2014	3/10/2014	PRN4, PRN20	None	WAAS issued "Do Not Use" alerts for PRN-4 and PRN-20 while these satellites were coming into view of WAAS but still in the "Not Monitored" state. These alerts were caused by false maneuver detections in the WAAS orbit estimation algorithms caused by poor quality measurements from a single receiver. See DR 122.
3/11/2014	3/11/2014	PRN21	LPV200_CONUS, LPV200_Canada	PRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused LPV-200 service outages in eastern Canada and Maine for about 20 minutes starting at 00:25Z. There was additional LPV-200 and LPV service degradations to Canada and LPV-200 service degradations in northern Alaska from ionosphere disturbances on this same day. Please see plot(s): LPV200_3/11/2014
3/11/2014	3/11/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The high GIVE values caused outages of both the LPV and LPV-200 services in northern Canada and the LPV-200 service in northern Alaska. A glitch on PRN-21 caused an LPV-200 outage in eastern Canada and Maine for about 20 minutes starting at 00:25 on this same day. Please see plot(s): LPV_3/11/2014 LPV200_3/11/2014
3/12/2014	3/13/2014	Washington D.C.	LPV_Alaska,	Geomagnetic activity (Kp = 3 on 3/12/14 and Kp =

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		(CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	5 on 3/13) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused minor degradation to LPV-200 service in northern Canada on the 12th. On the 13th the elevated GIVE values caused significant degradation to both the LPV-200 and LPV services in Canada and Alaska. Please see plot(s): LPV200_3/12/2014 LP_3/13/2014 LPV_3/13/2014
3/12/2014	3/12/2014	Barrow (BRW1), Barrow (BRW2), Barrow (BRW3), Bethel (BET1), Bethel (BET2), Bethel (BET3), Fairbanks (FAI1), Fairbanks (FAI2), Fairbanks (FAI3), Kotzebue (OTZ1), Kotzebue (OTZ2), Kotzebue (OTZ3)	LPV200_Alaska	Brief simultaneous outages (~10 to 20 seconds) on the satellite communications links to Barrow, Fairbanks, Bethel, and Kotzebue caused a brief LPV-200 outage to northern Alaska. Ionosphere disturbances also caused degradation to the LPV-200 service in northern Alaska on this same day. See DR 119. Please see plot(s): LPV200_3/12/2014
3/14/2014	3/14/2014	PRN4	LPV_Canada, LPV200_Canada	PRN-4 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-4 to be re-initialized. This caused the temporary loss of service from PRN-4 as the smoothing algorithm settled. This caused outages to both the LPV and LPV-200 service outages in eastern Canada for about 20 minutes starting at 07:49Z.
3/14/2014	3/14/2014	PRN21	LPV200_CONUS, LPV200_Canada	PRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused LPV-200 service outages in eastern Canada and new England for about 10 minutes starting at 23:51Z, with the LPV-200 impact to eastern Canada continuing into the next day for about 15 minutes. (need to add the W1783D6 LPV-200 link) Please see plot(s): LPV200_3/14/2014
3/15/2014	3/15/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Elevated GIVE values caused a brief degradation to LPV-200 service in north western Canada and northern Alaska starting at 11:18Z for about 13 minutes. Please see plot(s): LPV200_3/15/2014
3/17/2014	3/17/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Elevated GIVE values caused a minor degradation to LPV and LPV-200 services along the north eastern edge of Canada starting at about 21:00Z and continuing until the end of the day. Please see plot(s): LPV_3/17/2014

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				LPV200_3/17/2014
3/17/2014	3/17/2014	PRN21	LPV200_Canada	PRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused a minor loss of LPV-200 service outages in eastern Canada for about 20 minutes starting at 16:21Z Please see plot(s): LPV200_3/17/2014
3/18/2014	3/18/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Elevated GIVE values caused significant degradation to LPV and LPV-200 services in north western Canada and Alaska starting at 10:30Z and lasting for about 90 minutes.. Please see plot(s): LPV_3/18/2014 LPV200_3/18/2014
3/20/2014	3/20/2014	PRN24	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Planned maintenance on PRN-24 (NANU 2014030 Delta V maneuver) caused the temporary loss of services from that satellite which caused degradation of the LPV and LPV-200 service in Alaska and the LPV-200 service in western Canada. It also caused a brief (~5 minute) LPV-200 service outage along the coast of Oregon at about 06:00Z. Please see plot(s): LPV_3/20/2014 LPV200_3/20/2014
3/20/2014	3/20/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Elevated GIVE values caused degradation to LPV-200 services in north western Canada and northern Alaska starting at 11:00Z and lasting for about 20 minutes. Maintenance on PRN-24 caused more significant outages on this same day. Please see plot(s): LPV_3/20/2014 LPV200_3/20/2014
3/21/2014	3/21/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused very outages of the LPV and LPV-200 services in north western Canada and northern Alaska.. Please see plot(s): LPV_3/21/2014 LPV200_3/21/2014
3/21/2014	3/21/2014	PRN25	None	PRN25 updated ephemeris without changing the IODE and IODC. See DR120.
3/22/2014	3/22/2014	PRN21	LPV200_Alaska	PRN-21 experienced a carrier phase glitch that triggered the WAAS carrier smoothing algorithm cycle slip detectors causing the carrier smoothing for PRN-21 to be re-initialized. This caused the temporary loss of service from PRN-21 as the smoothing algorithm settled. This caused a minor loss of LPV-200 service in south western Alaska for about 10 minutes starting at 11:13Z. Please see plot(s): LPV200_3/22/2014
3/23/2014	3/23/2014	Washington D.C.	LPV_Canada,	Elevated GIVE values caused degradation to LPV-

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
		(CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	200 service in northern Canada and northern Alaska, and a minor outage to LPV service along the northern edge of coverage for Canada. Please see plot(s): LPV_3/23/2014 LPV200_3/23/2014
3/24/2014	3/28/2014		All	G2 and G3 receiver SV Glitch data is not available in this report for these days due a hardware problem in the data analysis facility.
3/24/2014	3/24/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	There was a small, brief (~30 second) outage of LPV-200 service in Oklahoma due to a GIVE value for an IGP being 3.6 meters instead of the normal 3 meters. This resulted in the VPL reaching 35.1 meters. The VAL threshold for LPV-200 is 35 meters. Another event repeated on 3/25/14. Please see plot(s): LPV200_3/24/2014
3/25/2014	3/26/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3 on 3/25/14 and Kp = 4 on 3/26/14) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused minor degradation to LPV-200 service in northern Canada on the 25th. On the 26th the elevated GIVE values cause significant degradation to both the LPV-200 and LPV services in eastern Canada and minor degradation to the LPV-200 service in north east Alaska. Please see plot(s): LPV200_3/25/2014 LPV_3/26/2014 LPV200_3/26/2014
3/27/2014	3/29/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (Kp = 3 on all three days) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused minor degradation to LPV-200 service in northern Canada on the 27th. On the 28th the elevated GIVE values cause significant degradation to both the LPV-200 and LPV services in north eastern Canada and minor degradation to the LPV-200 service in north Alaska. On the 29th the elevated GIVE values caused degradation of the LPV-200 service in north central Canada and north eastern Alaska. Please see plot(s): LPV200_3/27/2014 LPV_3/28/2014 LPV200_3/28/2014 LPV200_3/29/2014
3/30/2014	3/30/2014	PRN138	LPV_Canada, LPV200_Canada	CRE, PRN-138 was alarmed to "Do Not Use" for ranging from 20:48Z to 22:46Z due to the WAAS code to carrier coherency (CCC) monitor tripping for that ranging signal. The corrections data link functionality for CRE was not impacted. The elevated UDREs for PRN-138 along with elevated GIVEs from the disturbed ionosphere resulted in degraded LPV and LPV-200 service coverage in northern Canada. The CCC trip was caused by severe weather (heavy wet snow) at the Woodbine MD uplink site for CRE.

Start Date	End Date	Location/ Satellite	Service Affected	Event Description
				Please see plot(s): LPV_3/30/2014 LPV200_3/30/2014
3/31/2014	4/2/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV), PRN19	None	UDRE for PRN-19 bumped to "Not Monitored" for a very short interval at about 15:10Z. The bump was caused by a false residual over threshold trip in the internal UDDRE monitor from daily bad multipath at Tapachula (MTP) on both the A and B threads at the same time. The multipath issue repeated daily for multiple days.
3/31/2014	3/31/2014	Barrow (BRW1), Barrow (BRW2), Barrow (BRW3), Bethel (BET1), Bethel (BET2), Bethel (BET3), Kotzebue (OTZ1), Kotzebue (OTZ2), Kotzebue (OTZ3)	LPV200_Alaska	A short, simultaneous loss of communications on both networks to the Barrow, Kotzebue, and Bethel sites resulted in a brief (5 minute) outage of the LPV-200 service in north west Alaska starting at about 17:32Z.
3/31/2014	3/31/2014	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values caused very minor degradation to LPV service in northern Canada and northern Alaska, and minor degradation to the LPV-200 service in northern Canada and north eastern Alaska. Please see plot(s): LPV_3/31/2014 LPV200_3/31/2014

Table 1-6 WAAS Upgrades

Start Date	End Date	Location	Event Description
01/06/2014	01/06/2014	Winnipeg (YWG1), Winnipeg (YWG2), Winnipeg (YWG3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/07/2014	01/08/2014	Memphis (ZME1), Memphis (ZME2), Memphis (ZME3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/08/2014	01/08/2014	Minneapolis (ZMP1), Minneapolis (ZMP2), Minneapolis (ZMP3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/08/2014	01/08/2014	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/09/2014	01/09/2014	Anchorage (ZAN1), Anchorage (ZAN2), Anchorage (ZAN3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.

Start Date	End Date	Location	Event Description
01/10/2014	01/10/2014	Memphis (ZME1)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/13/2014	01/14/2014	Billings (BIL1), Billings (BIL2), Billings (BIL3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/13/2014	01/13/2014	Minneapolis (ZMP1)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/13/2014	01/14/2014	San Juan (ZSU1), San Juan (ZSU2), San Juan (ZSU3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/13/2014	01/14/2014	Tapachula (MTP1), Tapachula (MTP2), Tapachula (MTP3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/13/2014	01/13/2014	Puerto Vallarta (MPR1), Puerto Vallarta (MPR2), Puerto Vallarta (MPR3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/15/2014	01/16/2014	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/15/2014	01/15/2014	Oakland (ZOA1), Oakland (ZOA2)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/15/2014	01/15/2014	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	Overlapping communications outages to both networks to the Goose Bay Canada resulted in the temporary loss of service from that reference station which degraded performance and degraded LPV-200 service coverage to eastern Canada.
01/16/2014	01/17/2014	Denver (ZDV1), Denver (ZDV2), Denver (ZDV3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/16/2014	01/17/2014	Juneau (JNU1), Juneau (JNU2), Juneau (JNU3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/17/2014	01/17/2014	Merida (MMD1), Merida (MMD2), Merida (MMD3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/22/2014	01/22/2014	Houston (ZHU2), Houston (ZHU3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.
01/22/2014	01/23/2014	Oakland (ZOA1), Oakland (ZOA2), Oakland (ZOA3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.

Start Date	End Date	Location	Event Description
01/24/2014	01/24/2014	Cleveland (ZOB1), Cleveland (ZOB2), Cleveland (ZOB3), Dallas (ZFW1), Dallas (ZFW2), Dallas (ZFW3), Salt Lake City (ZLC1), Salt Lake City (ZLC2), Salt Lake City (ZLC3)	WRS processors successfully rebaselined and upgraded to build W7.006 per SSM-WAAS-34.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location/ Satellite	Service Affected	Event Description
1/2/2014	1/2/2014	Manual	GEO133, Santa Paula (SZP)	None	GEO 133, manual switchover from Santa Paula to Paumalu. TOW 417692-417697
1/10/2014	1/10/2014	Manual	GEO133, Paumalu (HDH)	None	GEO 133, manual switchover from Paumalu to Santa Paula at 23:27:25 to allow maintenance to be performed at Santa Paula. TOW 516461-516466
1/17/2014	1/17/2014	Manual	GEO133, Santa Paula (SZP)	None	GEO 133, manual switchover from Santa Paula to Paumalu. TOW 460851-460856
1/17/2014	1/17/2014	Manual	GEO133, Paumalu (HDH)	None	Manual switchover on GEO133 from Paumalu to Santa Paula in preparation for maintenance at Paumalu. TOW 513026-513034
2/3/2014	2/3/2014	Manual	GEO133, Santa Paula (SZP)	None	GEO 133, manual switchover from Santa Paula to Paumalu.. TOW 149299-149304
2/7/2014	2/7/2014	Manual	GEO133, Paumalu (HDH)	None	GEO 133, manual switchover from Paumalu to Santa Paula. TOW 460850-460855
2/12/2014	2/12/2014	Manual	GEO138, Woodbine (QWE)	LPV_Canada, LPV200_Alaska, LPV200_Canada	There were 3 events for the CRE GEO, PRN-138 on 2/12/14: 1) PRN-138 was alarmed to "Do Not Use" for ranging from 09:44Z to 11:15Z due to the WAAS code to carrier coherency (CCC) monitor tripping for that ranging signal, 2) there was an automatic uplink switch for the CRE GEO from the Brewster WA uplink to the Woodbine MD uplink at 12:42Z due to the Brewster uplink faulting, and 3) there was an operator initiated uplink switch for CRE from Woodbine back to Brewster at 20:30Z. The cause of the failure at Brewster was snow damage to the antenna element feed of the L-band

Start Date	End Date	GUS Switch	Location/ Satellite	Service Affected	Event Description
					downlink dish. These events resulted in high UDRE's for the CRE, PRN-138, ranging signal which contributed to the LPV and LPV-200 service outages in Canada and the LPV-200 service outages in Alaska. Please see plot(s): LPV_2/12/2014 LPV200_2/12/2014
2/16/2014	2/16/2014	Faulted	GEO138, Brewster (BRE-B)	All	GEO 138 switched to Woodbine when Brewster faulted. The elevated UDREs for PRN-138 along with elevated GIVEs from the disturbed ionosphere resulted in degraded LPV and LPV-200 service coverage. Please see plot(s): LPV_2/16/2014 LPV200_2/16/2014

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 provides the WAAS G3 Novatel receiver performance.

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 1.526 meters and 1.867 meters at Atlantic City and Miami, respectively. The minimum 95% CONUS horizontal and vertical LPV errors are 0.636 meters and 0.903 meters at Los Angeles and Denver, respectively. The maximum 95% and 99.999% NPA horizontal errors are 8.221 meters and 21.704 meters, both at Honolulu. The minimum 95% and 99.999% horizontal errors are 1.338 meters and 3.72 meters at Oakland and Kansas City, respectively.

The increases in position errors during this reporting period are mainly due to geomagnetic activity. The increases in 95% position errors on 02/19/2014, 02/27/2014, 02/28/2014, and 03/13/2014 in Figure 2.1 to 2.6 are due to geomagnetic activity. The increases in 95% position errors on 02/23/2014 in Figure 2.1 to 2.6 in Canada, Alaska and northern CONUS are also due to geomagnetic activity. The increases in 95% NPA position errors on 02/19/2014, 02/27/2014, 02/28/2014, 03/13/2014, 03/27/2014, and 03/28/2014 in Figure 2.7 to 2.8 are due to geomagnetic activity as well. The increases in 95% position errors on 01/28/2014 and 02/16/2014 in Figure 2.7 to 2.8 in Canada and Alaska are due to geomagnetic activity. The increases in 95% position errors on 02/23/2014 in Figure 2.7 to 2.8 in Canada and slight increases in northern CONUS are 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	1.200	1.200	1.419	100	*	*
Atlantic City	1.526	1.530	1.637	100	*	*
Grand Forks	1.193	1.202	1.502	100	*	*
Oklahoma City	0.943	0.943	1.376	100	*	*
Albuquerque	0.701	0.701	0.984	100	2.318	5.619
Anchorage	0.743	0.748	1.385	100	*	*
Atlanta	0.825	0.825	1.361	100	2.566	5.635
Barrow	0.952	0.968	2.101	100	*	*
Bethel	0.649	0.650	1.146	100	2.479	7.078
Billings	0.924	0.927	1.101	100	2.265	5.299
Boston	0.907	0.912	1.112	100	2.695	5.044
Chicago	0.906	0.909	1.017	100	*	*
Cleveland	0.849	0.853	1.042	100	2.578	5.108
Cold Bay	0.730	0.731	1.193	100	*	*
Dallas	0.807	0.807	1.460	100	*	*
Denver	0.690	0.690	0.903	100	*	*
Fairbanks	0.710	0.720	1.377	100	2.671	6.486
Gander	1.039	1.048	1.322	100	*	*
Goose Bay	1.027	1.040	1.338	100	*	*
Houston	0.905	0.905	1.661	100	2.720	6.248
Iqaluit	1.469	1.524	2.424	100	*	*
Jacksonville	0.906	0.906	1.556	100	*	*
Juneau	0.818	0.826	1.332	100	*	*
Kansas City	0.754	0.754	1.010	100	2.450	5.334
Kotzebue	0.833	0.847	1.496	100	2.886	6.806
Los Angeles	0.636	0.636	1.073	100	2.210	6.413
Memphis	0.786	0.786	1.181	100	*	*
Merida	0.934	0.934	1.875	100	*	*
Mexico City	0.935	0.935	2.536	100	*	*
Miami	1.021	1.021	1.867	100	3.044	5.947
Minneapolis	0.818	0.823	0.941	100	2.398	5.051
New York	0.985	0.988	1.061	100	*	*
Oakland	0.664	0.664	1.105	100	2.151	6.542
Puerto Vallarta	0.986	0.986	2.284	100	*	*
Salt Lake City	0.710	0.710	0.934	100	2.184	5.552
San Jose Del Cabo	0.952	0.952	2.125	100	*	*
Seattle	0.901	0.905	1.026	100	2.172	5.518
Washington DC	0.906	0.909	1.198	100	2.658	5.379
Winnipeg	0.890	0.896	1.186	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	1.467	4.387	100	4.577
Anchorage	2.177	5.783	100	5.932
Atlanta	1.611	4.606	100	4.848
Barrow	2.792	7.758	100	7.950
Bethel	2.074	5.609	100	5.785
Billings	1.813	5.817	100	6.168
Boston	1.892	8.574	100	8.744
Cleveland	1.676	6.524	100	6.668
Cold Bay	1.697	8.457	100	8.824
Fairbanks	2.325	7.265	100	7.448
Gander	2.127	8.581	100	8.904
Honolulu	8.221	21.704	100	22.501
Houston	1.910	6.255	100	6.548
Iqaluit	2.926	7.834	100	7.973
Juneau	1.921	8.489	100	8.749
Kansas City	1.466	3.720	100	3.874
Kotzebue	2.451	5.740	100	5.855
Los Angeles	1.606	4.578	100	5.057
Merida	2.723	8.697	100	8.887
Miami	2.224	6.904	100	7.084
Minneapolis	1.714	9.855	100	10.099
Oakland	1.338	4.251	100	4.398
Salt Lake City	1.401	4.384	100	4.617
San Jose Del Cabo	2.789	10.343	100	10.531
San Juan	4.911	18.588	100	18.902
Seattle	1.657	6.258	100	6.438
Tapachula	4.620	15.718	100	16.082
Washington DC	1.840	4.779	100	4.963

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	3.359	0.218	0.232	4.466	0.111	0.171
Atlantic City	2.900	0.262	0.277	4.293	0.089	0.237
Grand Forks	3.162	0.188	0.250	7.395	0.228	0.246
Oklahoma City	2.545	0.165	0.252	4.159	0.130	0.219
Albuquerque	1.619	0.161	0.161	2.891	0.163	0.172
Anchorage	2.475	0.065	0.155	4.343	0.096	0.175
Atlanta	2.114	0.127	0.176	3.583	0.131	0.213
Barrow	3.392	0.098	0.170	6.542	0.159	0.224
Bethel	2.166	0.060	0.124	3.750	0.127	0.147
Billings	1.894	0.190	0.192	4.458	0.113	0.165
Boston	2.993	0.134	0.221	5.444	0.140	0.190
Chicago	2.832	0.085	0.202	7.190	0.160	0.179
Cleveland	2.023	0.128	0.175	4.781	0.168	0.195
Cold Bay	2.947	0.076	0.137	4.897	0.106	0.131
Dallas	1.735	0.159	0.178	4.117	0.209	0.218
Denver	1.949	0.131	0.186	3.467	0.092	0.172
Fairbanks	2.755	0.104	0.179	5.361	0.278	0.278
Gander	3.776	0.097	0.142	5.689	0.134	0.134
Goose Bay	4.293	0.119	0.214	6.403	0.158	0.221
Houston	2.232	0.190	0.211	3.909	0.186	0.216
Iqaluit	4.145	0.118	0.186	7.046	0.158	0.208
Jacksonville	1.997	0.148	0.174	3.285	0.192	0.220
Juneau	4.484	0.168	0.230	5.292	0.177	0.209
Kansas City	2.984	0.090	0.186	4.598	0.139	0.203
Kotzebue	4.070	0.102	0.162	4.776	0.107	0.189
Los Angeles	2.054	0.130	0.130	2.973	0.152	0.152
Memphis	1.830	0.196	0.196	4.804	0.188	0.209
Merida	2.448	0.134	0.180	3.946	0.106	0.192
Mexico City	3.255	0.151	0.152	4.962	0.104	0.215
Miami	3.473	0.169	0.221	3.931	0.099	0.203
Minneapolis	3.593	0.126	0.191	4.718	0.103	0.200
New York	2.061	0.104	0.182	4.317	0.125	0.179
Oakland	1.912	0.145	0.152	3.751	0.146	0.146
Puerto Vallarta	3.372	0.162	0.162	5.635	0.155	0.177
Salt Lake City	2.081	0.181	0.186	3.585	0.120	0.162
San Jose Del Cabo	2.929	0.167	0.167	4.707	0.099	0.159
Seattle	2.398	0.173	0.203	5.810	0.116	0.175
Washington DC	1.956	0.150	0.173	3.466	0.087	0.184
Winnipeg	2.705	0.104	0.193	6.242	0.163	0.196

Figure 2-1 LPV 95% Horizontal Accuracy

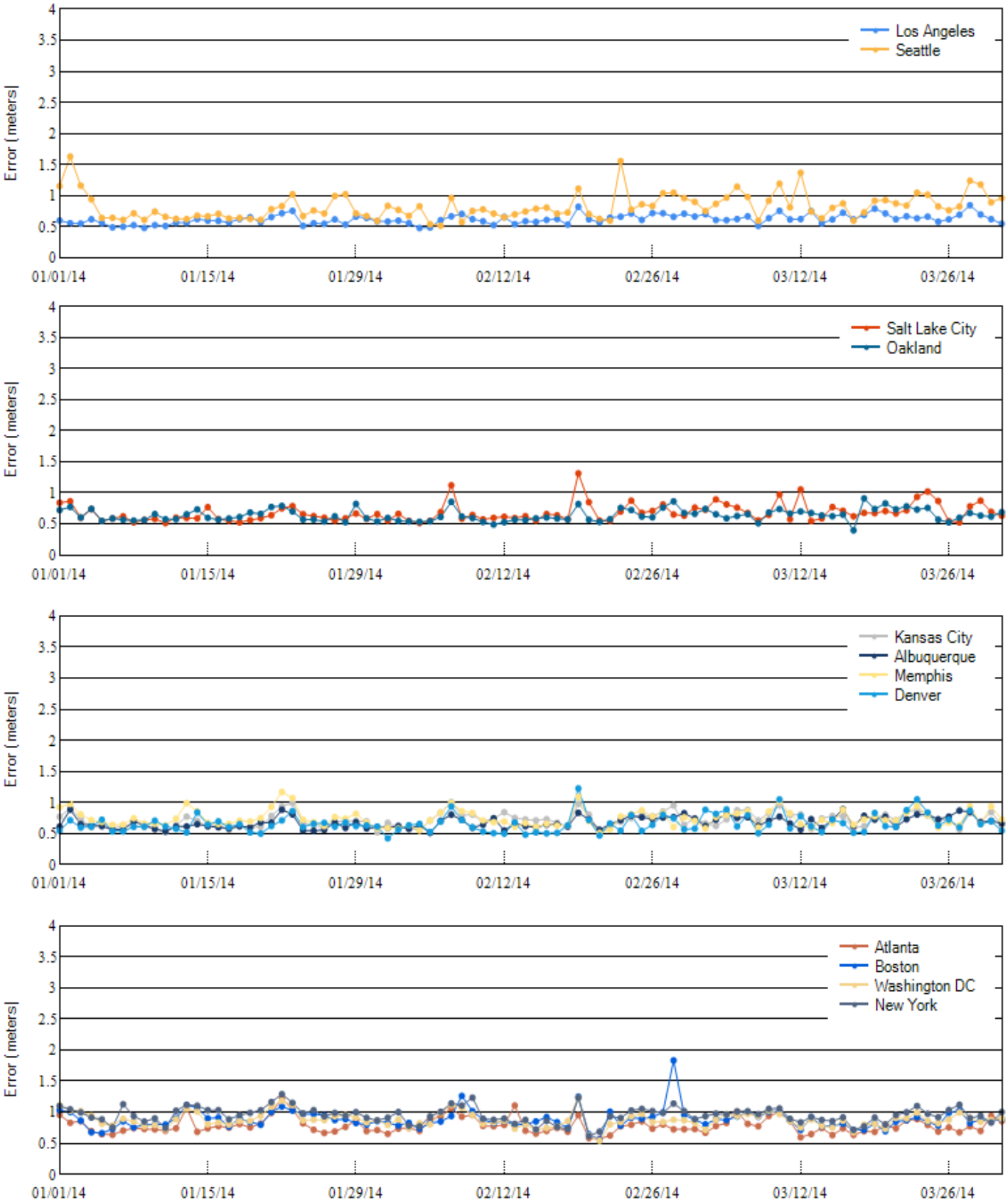


Figure 2-2 LPV 95% Horizontal Accuracy

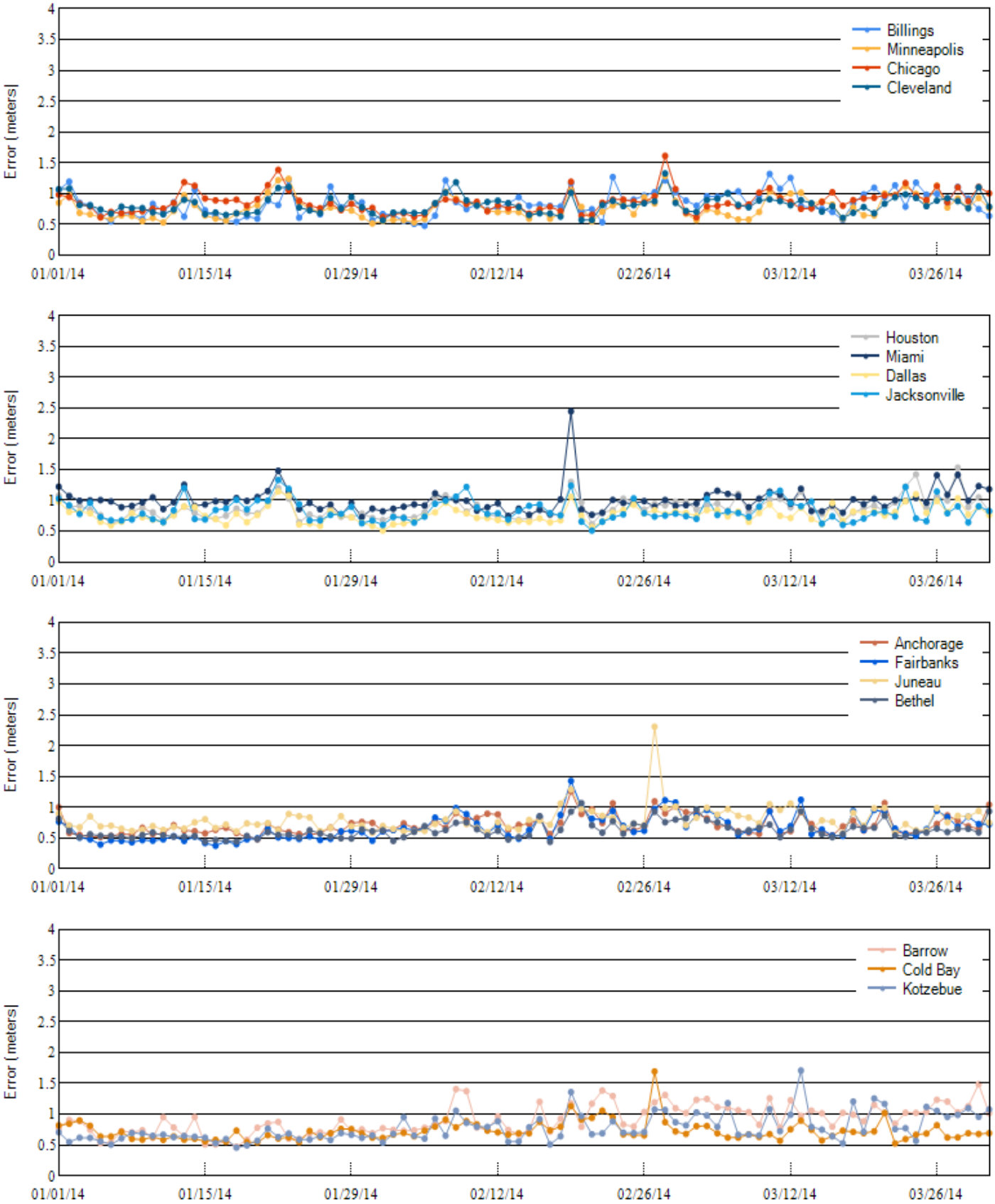


Figure 2-3 LPV 95% Horizontal Accuracy

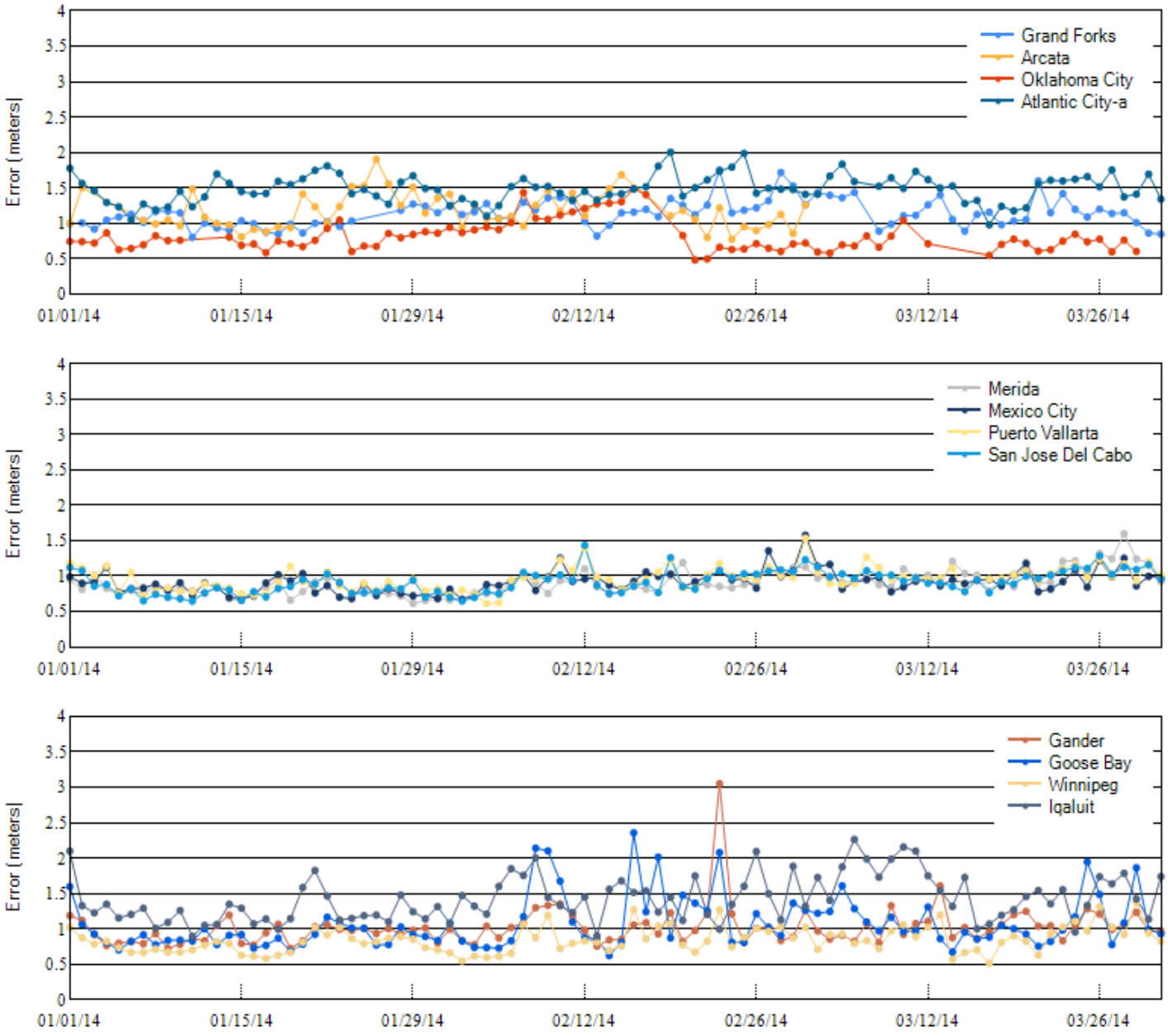


Figure 2-4 LPV 95% Vertical Accuracy

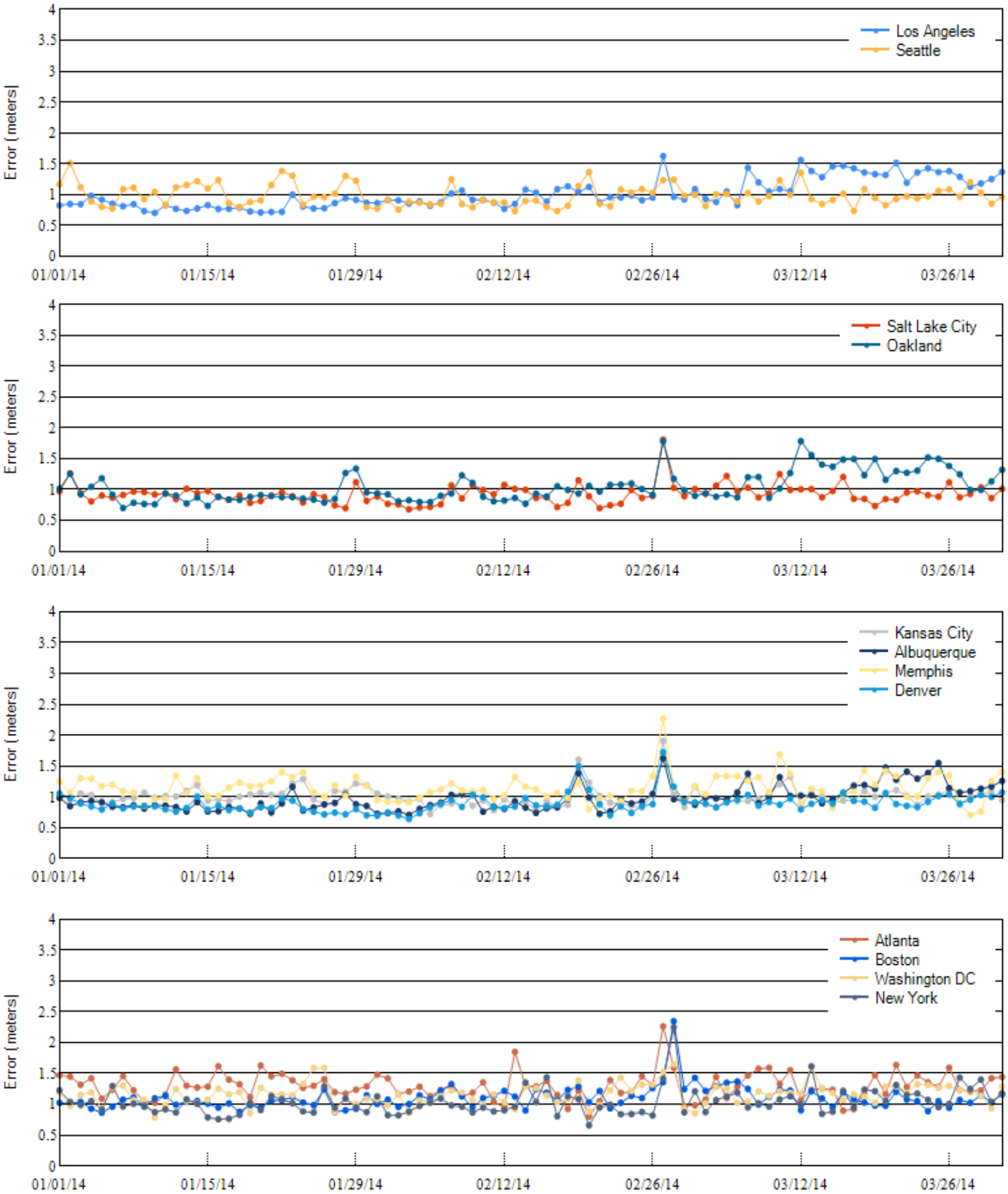


Figure 2-5 LPV 95% Vertical Accuracy

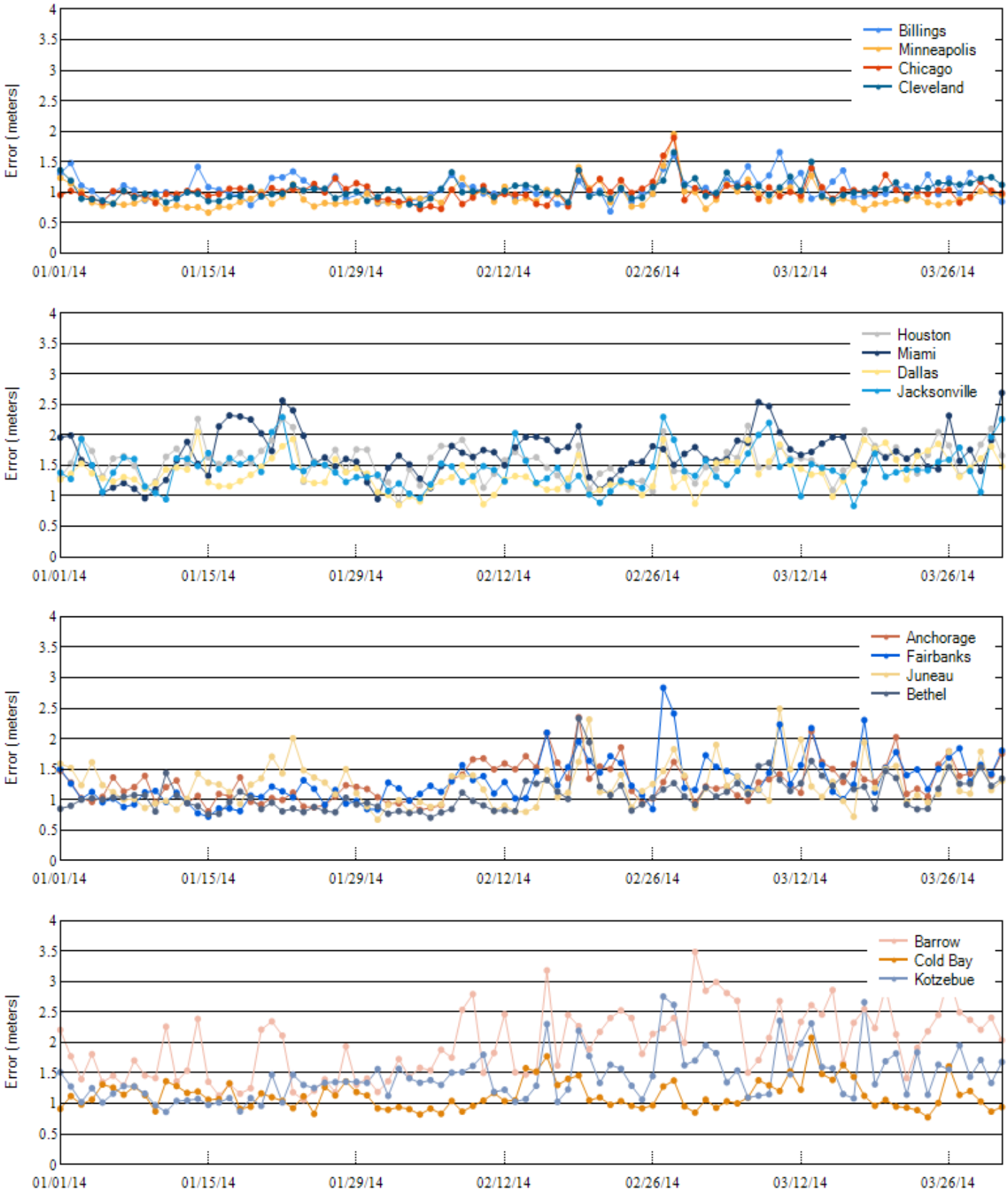


Figure 2-6 LPV 95% Vertical Accuracy

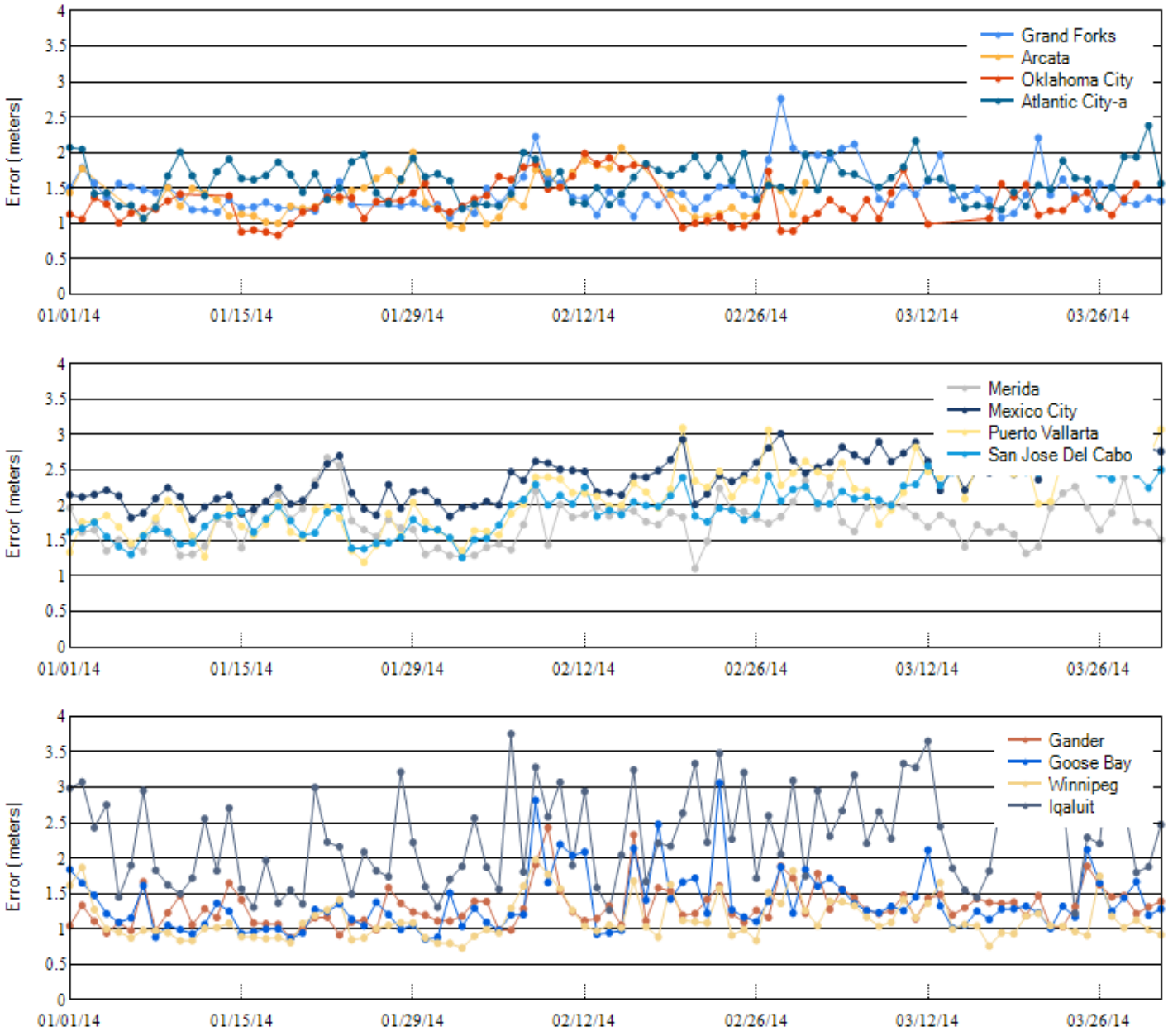


Figure 2-7 NPA 95% Horizontal Accuracy

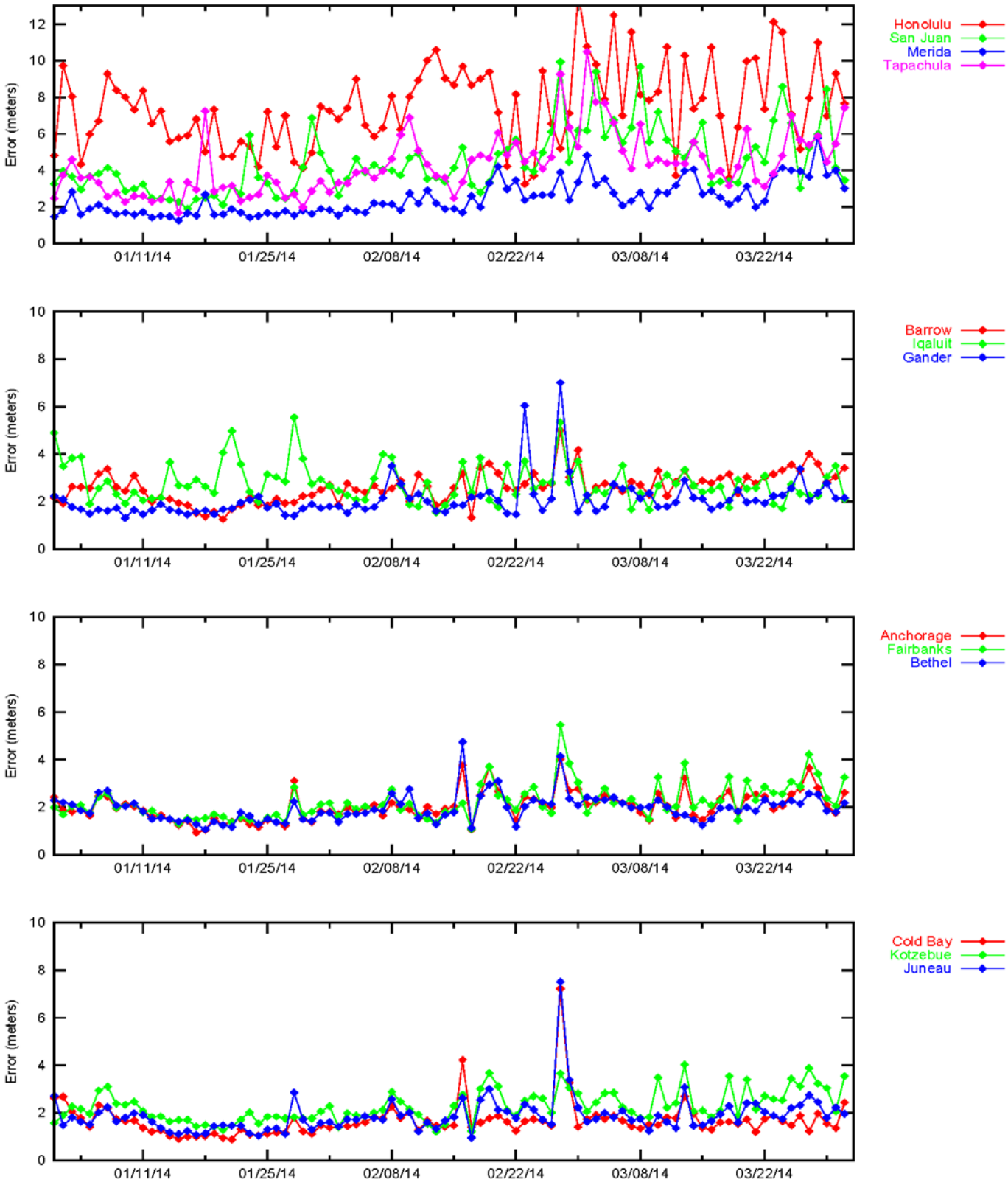


Figure 2-8 NPA 95% Horizontal Accuracy

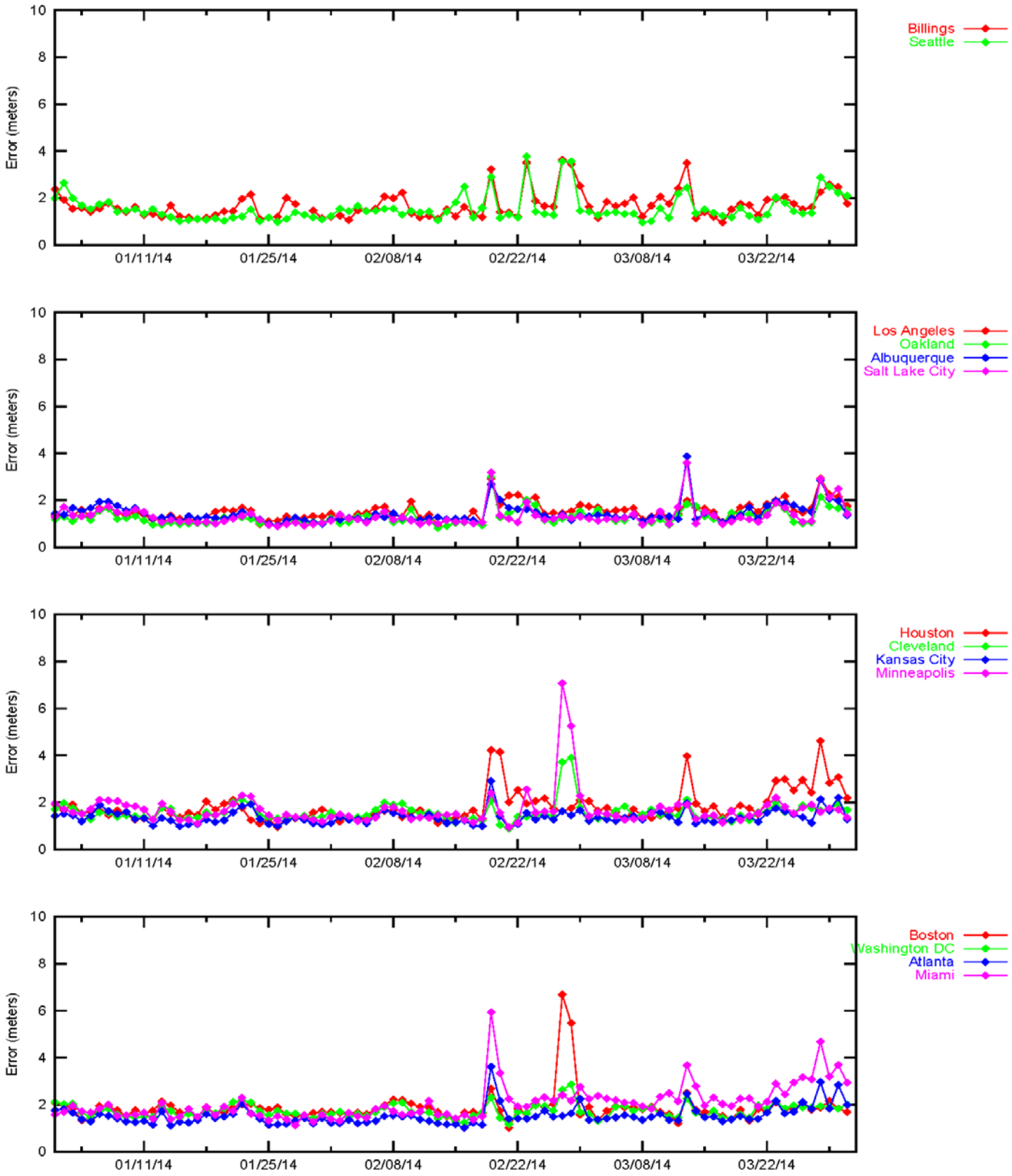


Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

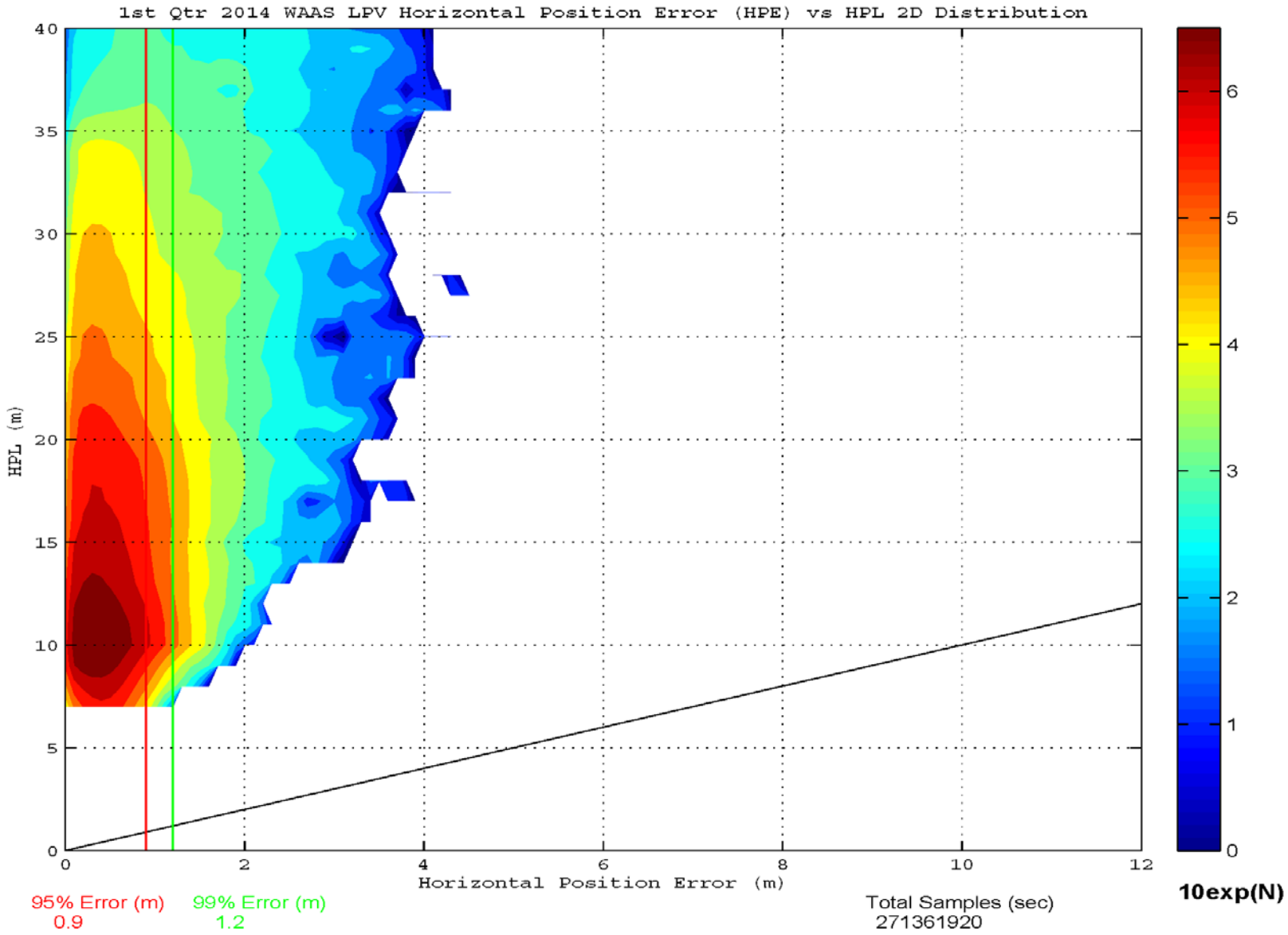


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

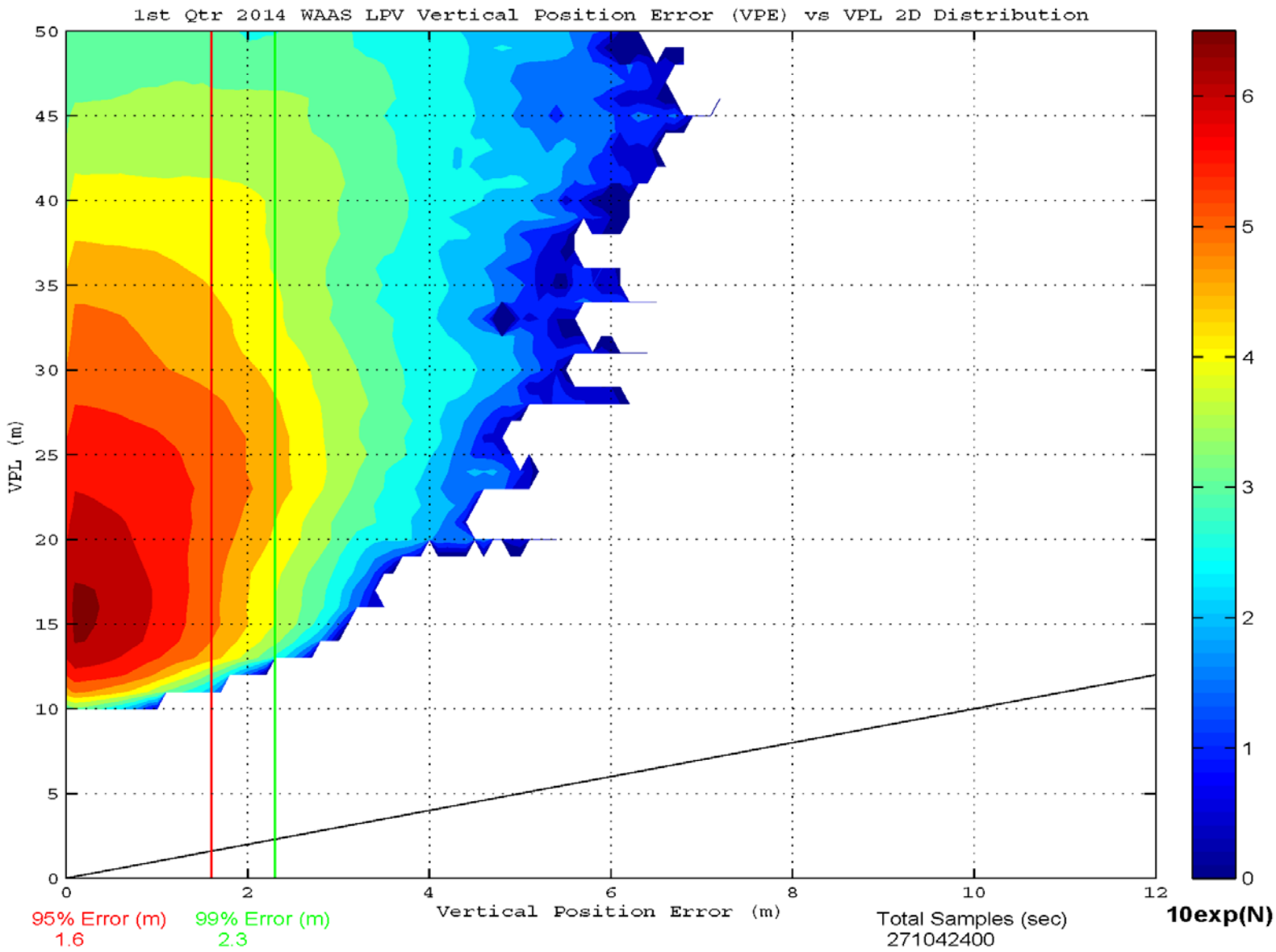


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

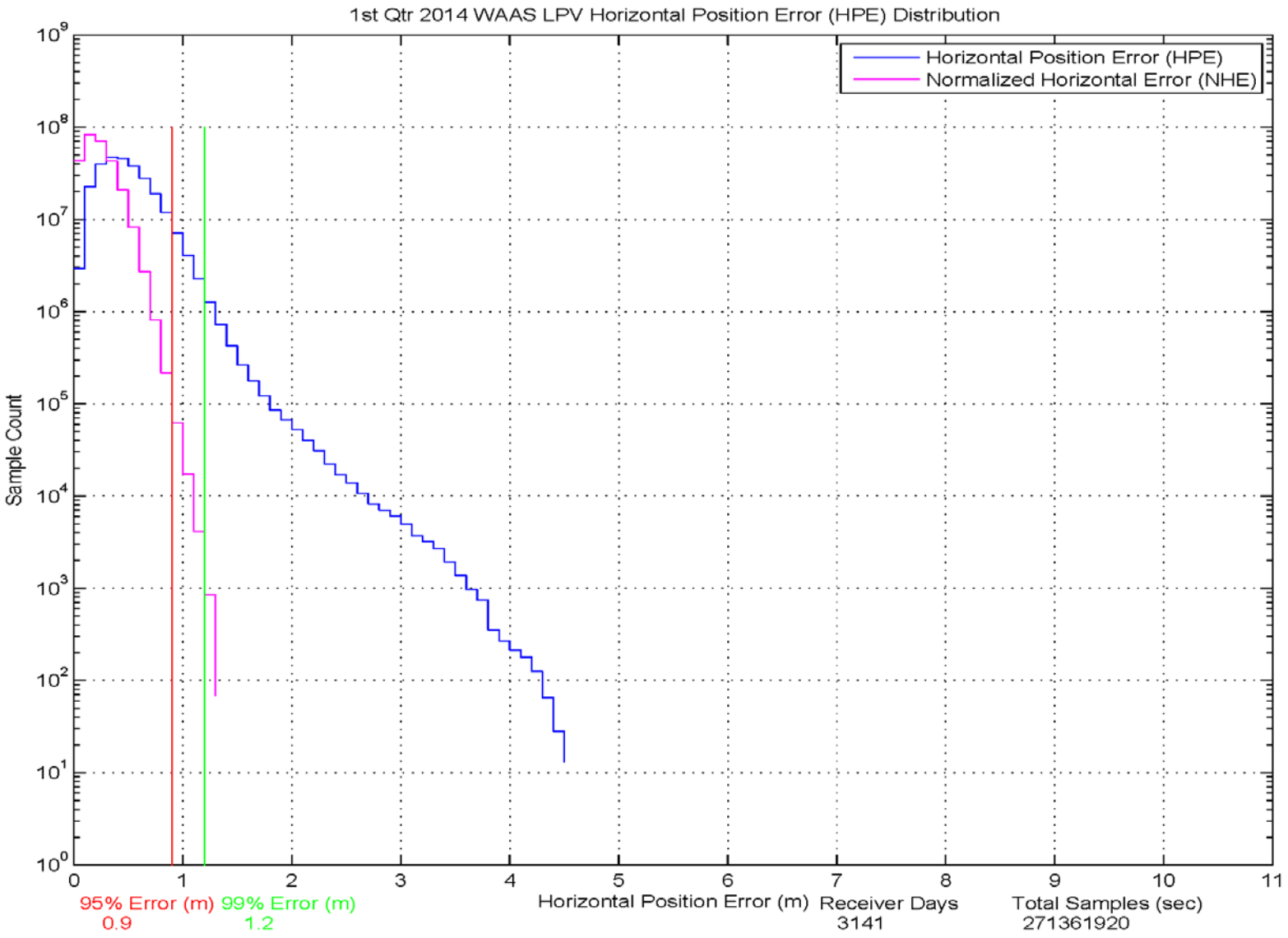
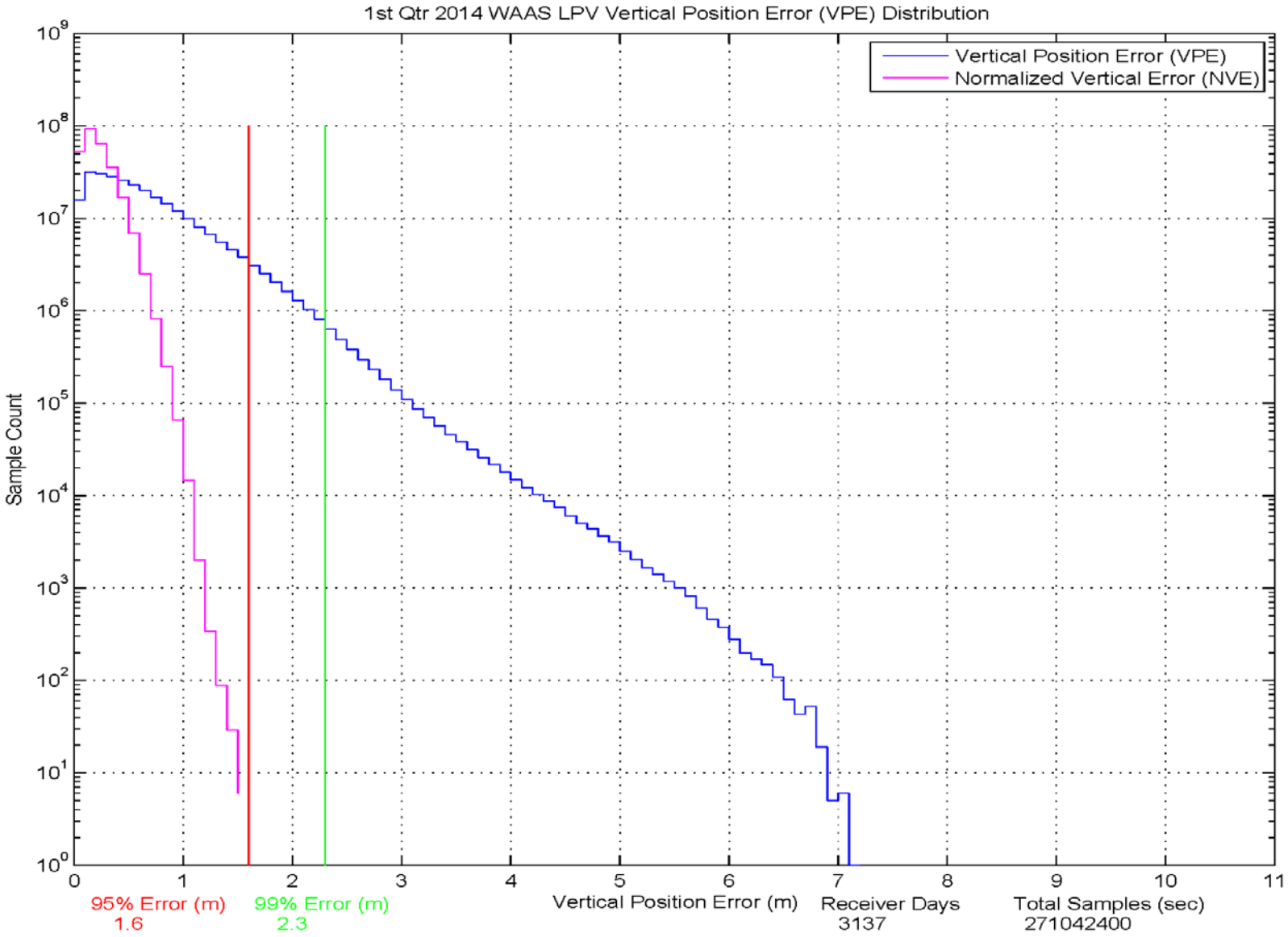


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



3.0 AVAILABILITY

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

For this reporting period, the maximum 99% CONUS HPL and VPL are 17.759 meters and 36.301 meters, both at Arcata. The minimum 99% CONUS HPL and VPL are 11.315 meters at Memphis and 20.482 meters at Kansas City, respectively. The maximum 99% Alaska HPL and VPL are 29.771 meters at Cold Bay and 43.302 meters at Barrow, respectively. The minimum 99% Alaska HPL and VPL are 16.204 meters at Anchorage and 25.563 meters at Juneau, respectively.

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

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

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

Manual GUS switchover on CRE GEO (PRN-138) on February 10 and February 12 along with geomagnetic activity elevated UDRE values and slightly reduced availability in Alaska and Canada.

Numerous brief carrier phase anomalies were observed for this reporting period. These anomalies caused WAAS to issue SV alert setting to “Not Monitored” resulted in slight availability reduction. Carrier phase anomalies on PRN-1 beginning on December 4 until February 3 resulted in minor reduction in LPV-200 CONUS availability on multiple days; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63. Carrier phase anomalies on PRN-21 also occurred on multiple days: on January 15 resulted in a slight reduction in LPV-200 CONUS and Mexico availability, on February 6 resulted in a small reduction in Alaska and Canada availability, on March 14 resulted in a minor reduction in CONUS and Canada availability, and on March 22 resulted in an insignificant reduction in Alaska availability. A carrier phase anomaly on PRN-32 on March 5 resulted in a slight reduction in LPV-200 Canada availability and on PRN-4 on March 14 resulted in a minor reduction in Canada availability.

Planned maintenance on PRN-19 on January 9 caused minor availability reduction in CONUS. Planned maintenance on PRN-22 on January 16 slightly affected CONUS and Canada availability. Planned maintenance on PRN-21 on February 7 resulted in an availability reduction in CONUS, Alaska and Canada. Planned maintenance on PRN-2 on February 14 in combination with CCC monitor trips on CRE GEO (PRN-138) affected CONUS, Alaska and Canada availability. Planned maintenance on PRN-16 on February 18 caused slight availability drop in Alaska. Planned maintenance on PRN-5 on March 5 caused minor availability reduction in Alaska. Planned maintenance on PRN-24 on March 20 affected Alaska and Canada availability.

A planned maintenance on PRN-17 along with PRN-25 carrier phase anomaly on March 7 contributed to the degradation of availability; see DR 121 PRN17 NANU and SV Alert on PRN 25 Affect WAAS Coverage.

Geomagnetic activity on January 1, January 21, February 12-16, March 3-4, March 10, March 13, March 18, and March 26 elevated GIVE values and affected availability in Alaska and Canada. Geomagnetic activity on February 19, February 23 and February 27-28 elevated GIVE values and caused slight degradation in availability in CONUS, Alaska and Canada. Geomagnetic activity on January 28, February 2, February 21, March 26, March 28, and March 31 elevated GIVE values and caused availability drop in Canada. Geomagnetic activity in the equatorial region on March 10 resulted in “Do Not Use” alerts on PRN-4 and PRN-20; see DR 122 PRN4 and PRN20 DNU due to Iono Equator.

Communication outages at Goose Bay on January 15 increased GIVE values and caused availability reduction in Canada. Communication outages at Goose Bay on February 9-11 along with geomagnetic activity increased GIVE values and caused availability reduction in Canada. Communication outages at Kotzebue on February 26 and February 28 increased GIVE values and affected availability in Alaska. Communication outages at Iqaluit on February 26 increased GIVE values and caused availability drop in Canada. Communication outages at Barrow, Bethel, Fairbanks, and Kotzebue on March 12 in combination with geomagnetic activity increased GIVE values and affected availability in Alaska; see DR 119 Geomagnetic Activity and Common WRS Communication Outages.

On March 21, an anomaly on PRN-25 ephemeris update was observed with no impact to availability. PRN-25 ephemeris was updated without changing IODE and IODC; see DR 120 PRN25 Illegal IODE IODC.

Radio frequency interference (RFI) caused localized loss of LPV/LPV200 availability at Boston on January 9, but had no effect on WAAS service.

Table 3-1 99% Protection Level

Location	99% HPL (meters)	99% VPL (meters)	Percentage in PA mode
Arcata	17.759	36.301	100
Atlantic City	14.539	22.753	100
Grand Forks	16.961	25.166	100
Oklahoma City	11.843	22.411	100
Albuquerque	12.175	24.152	100
Anchorage	16.204	25.733	100
Atlanta	12.120	21.062	100
Barrow	25.678	43.302	100
Bethel	19.998	31.345	100
Billings	15.830	22.334	100
Boston	15.943	22.785	100
Chicago	11.984	21.330	100
Cleveland	13.328	24.289	100
Cold Bay	29.771	38.141	100
Dallas	12.190	22.703	100
Denver	13.193	22.705	100
Fairbanks	16.770	27.222	100
Gander	29.557	44.178	100
Goose Bay	27.712	35.914	100
Houston	11.559	24.090	100
Iqaluit	46.542	64.333	100
Jacksonville	13.551	22.359	100
Juneau	16.313	25.563	100
Kansas City	11.816	20.482	100
Kotzebue	20.097	35.973	100
Los Angeles	14.779	26.991	100
Memphis	11.315	20.941	100
Merida	18.861	33.832	100
Mexico City	31.784	41.767	100
Miami	17.386	27.023	100
Minneapolis	13.553	26.103	100
New York	15.135	22.679	100
Oakland	17.124	33.073	100
Puerto Vallarta	32.894	54.051	100
Salt Lake City	14.256	21.477	100
San Jose Del Cabo	27.605	42.008	100
Seattle	16.622	28.363	100
Washington DC	13.239	24.135	100
Winnipeg	18.136	24.551	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	0.999965	0.999828	0.986617
Atlantic City-a	0.998273	0.998205	0.998156
Grand Forks	0.997356	0.997356	0.997138
Oklahoma City	1	1	1
Albuquerque	1	1	1
Anchorage	0.997701	0.997566	0.996536
Atlanta	1	1	0.999945
Barrow	0.993959	0.992238	0.964652
Bethel	0.998911	0.998102	0.996132
Billings	0.998356	0.998354	0.998124
Boston	0.997902	0.997902	0.997114
Chicago	0.998413	0.998283	0.998203
Cleveland	0.998335	0.998239	0.998202
Cold Bay	0.999732	0.999123	0.948257
Dallas	1	1	1
Denver	1	1	0.999697
Fairbanks	0.995932	0.995746	0.994703
Gander	0.996310	0.994291	0.858391
Goose Bay	0.996091	0.994919	0.984759
Houston	1	1	1
Iqaluit	0.982848	0.954584	0.786018
Jacksonville	1	1	1
Juneau	0.997183	0.996762	0.995442
Kansas City	0.999835	0.999811	0.999259
Kotzebue	0.994879	0.994404	0.985708
Los Angeles	1	1	0.999463
Memphis	1	1	0.999974
Merida	1	0.999890	0.993034
Mexico City	0.999425	0.998102	0.903231
Miami	1	1	0.999830
Minneapolis	0.998105	0.997989	0.997813
New York	0.998255	0.998218	0.997786
Oakland	1	0.999801	0.992043
Puerto Vallarta	0.999354	0.981777	0.882580
Salt Lake City	1	1	0.999884
San Jose Del Cabo	0.999780	0.999098	0.932576
Seattle	0.998078	0.997853	0.997557
Washington DC	0.998366	0.998259	0.998195
Winnipeg	0.997485	0.997361	0.996736

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	1	0.000032	3	0.000095	61	0.001963
Atlantic City	2	0.000039	2	0.000039	2	0.000039
Grand Forks	2	0.000041	2	0.000041	4	0.000081
Oklahoma City	0	0	0	0	0	0
Albuquerque	0	0	0	0	0	0
Anchorage	3	0.000058	3	0.000058	9	0.000174
Atlanta	0	0	0	0	1	0.000019
Barrow	11	0.000214	33	0.000644	249	0.004995
Bethel	6	0.000116	5	0.000097	14	0.000271
Billings	3	0.000059	3	0.000059	3	0.000059
Boston	3	0.000058	3	0.000058	10	0.000193
Chicago	2	0.000039	2	0.000039	2	0.000039
Cleveland	2	0.000039	2	0.000039	2	0.000039
Cold Bay	1	0.000019	6	0.000116	443	0.009012
Dallas	0	0	0	0	0	0
Denver	0	0	0	0	2	0.000039
Fairbanks	6	0.000116	6	0.000116	13	0.000252
Gander	8	0.000155	20	0.000388	589	0.013237
Goose Bay	5	0.000097	12	0.000233	95	0.001862
Houston	0	0	0	0	0	0
Iqaluit	73	0.001434	221	0.004471	794	0.019508
Jacksonville	0	0	0	0	0	0
Juneau	4	0.000078	4	0.000078	8	0.000157
Kansas City	1	0.000019	2	0.000039	2	0.000039
Kotzebue	8	0.000155	11	0.000213	79	0.001546
Los Angeles	0	0	0	0	5	0.000097
Memphis	0	0	0	0	1	0.000019
Merida	0	0	4	0.000077	92	0.001789
Mexico City	76	0.001474	85	0.001651	596	0.012793
Miami	0	0	0	0	7	0.000135
Minneapolis	2	0.000039	3	0.000058	3	0.000058
New York	2	0.000039	2	0.000039	6	0.000116
Oakland	0	0	2	0.000039	103	0.002004
Puerto Vallarta	7	0.000135	195	0.003837	652	0.014272
Salt Lake City	0	0	0	0	2	0.000039
San Jose Del Cabo	4	0.000077	18	0.000348	548	0.011338
Seattle	4	0.000077	4	0.000077	10	0.000193
Washington DC	2	0.000039	2	0.000039	3	0.000058
Winnipeg	2	0.000039	3	0.000058	7	0.000136

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

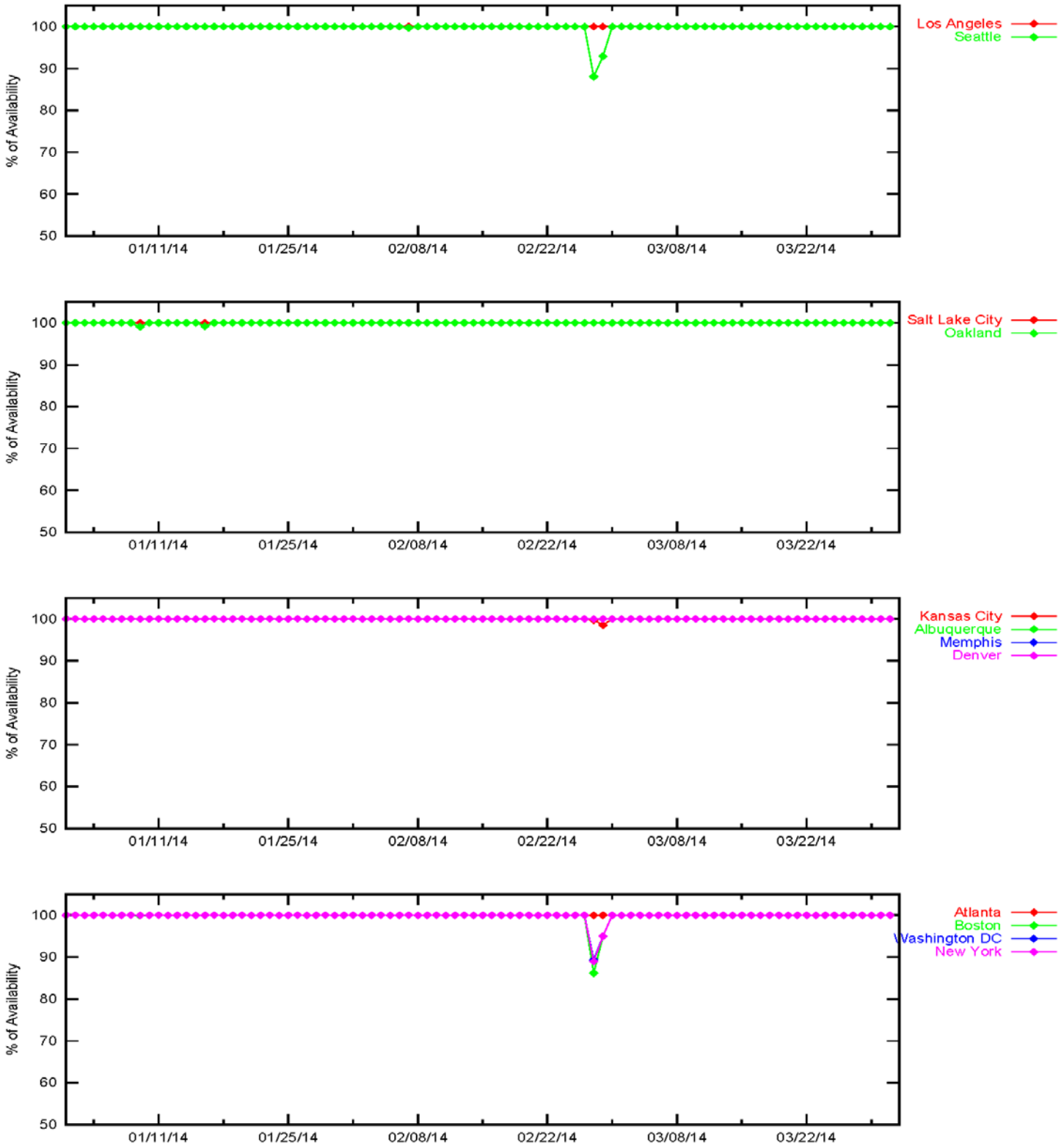


Figure 3-2 LPV Instantaneous Availability

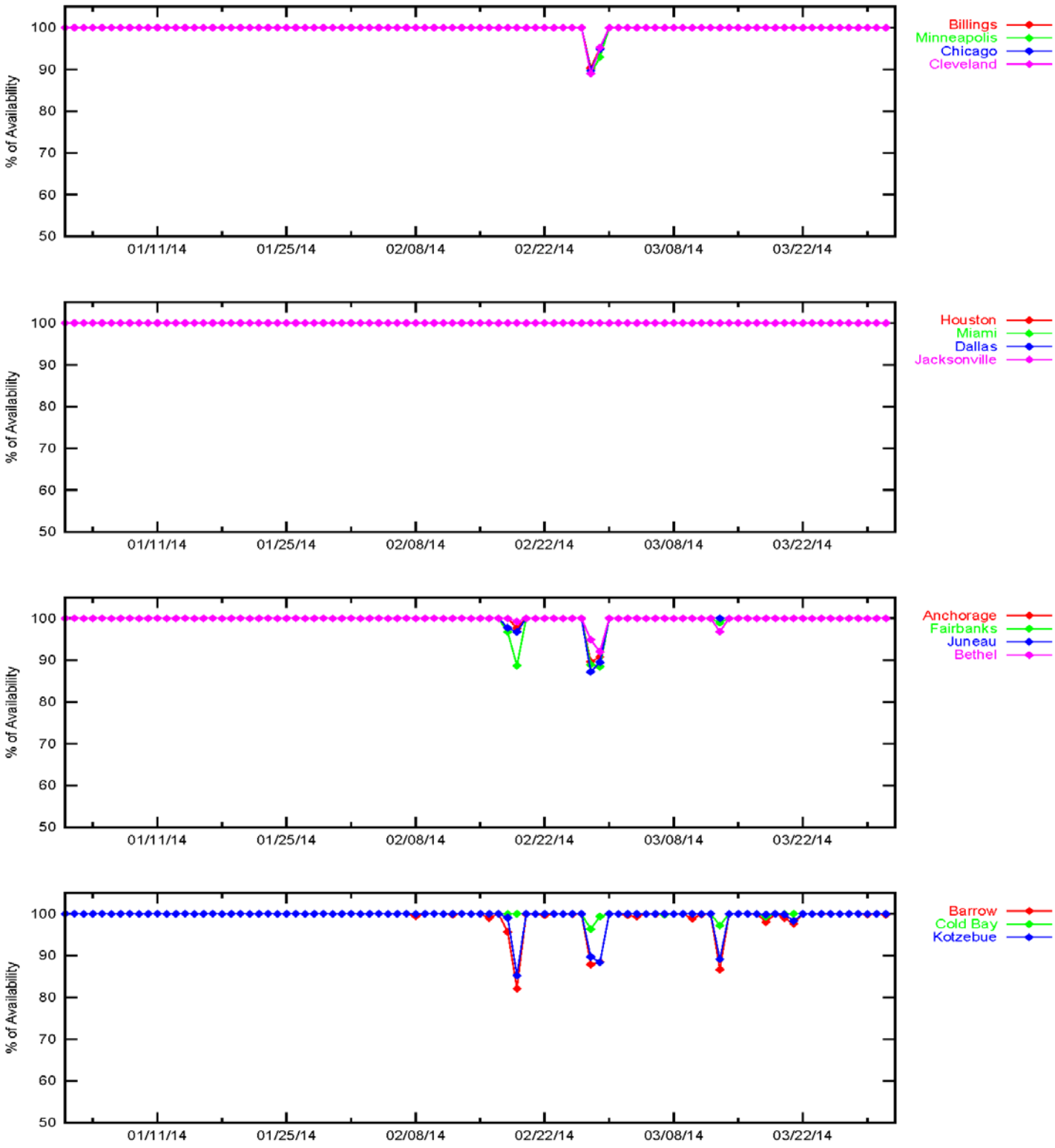


Figure 3-3 LPV Instantaneous Availability

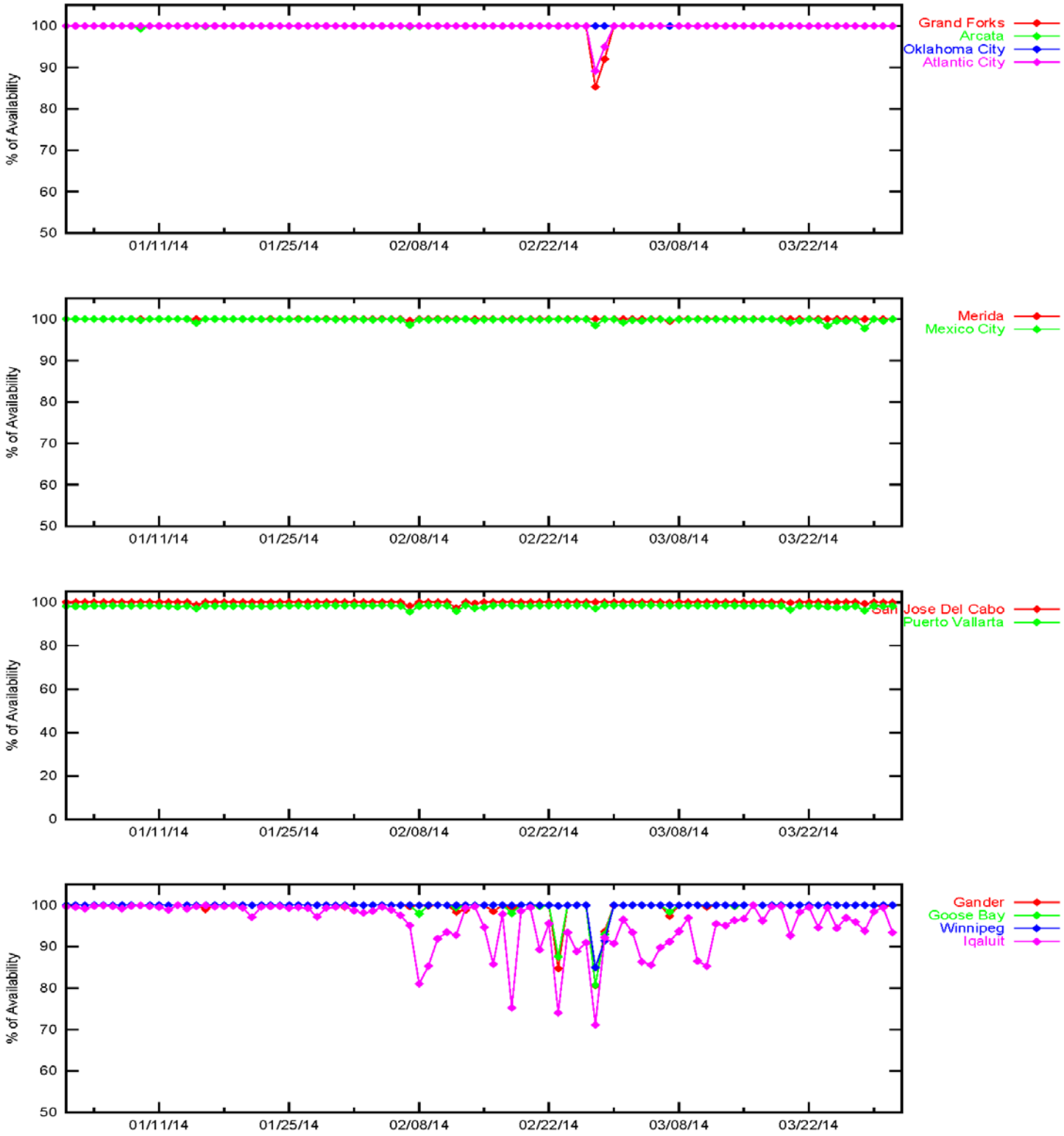


Figure 3-4 LPV 200 Instantaneous Availability

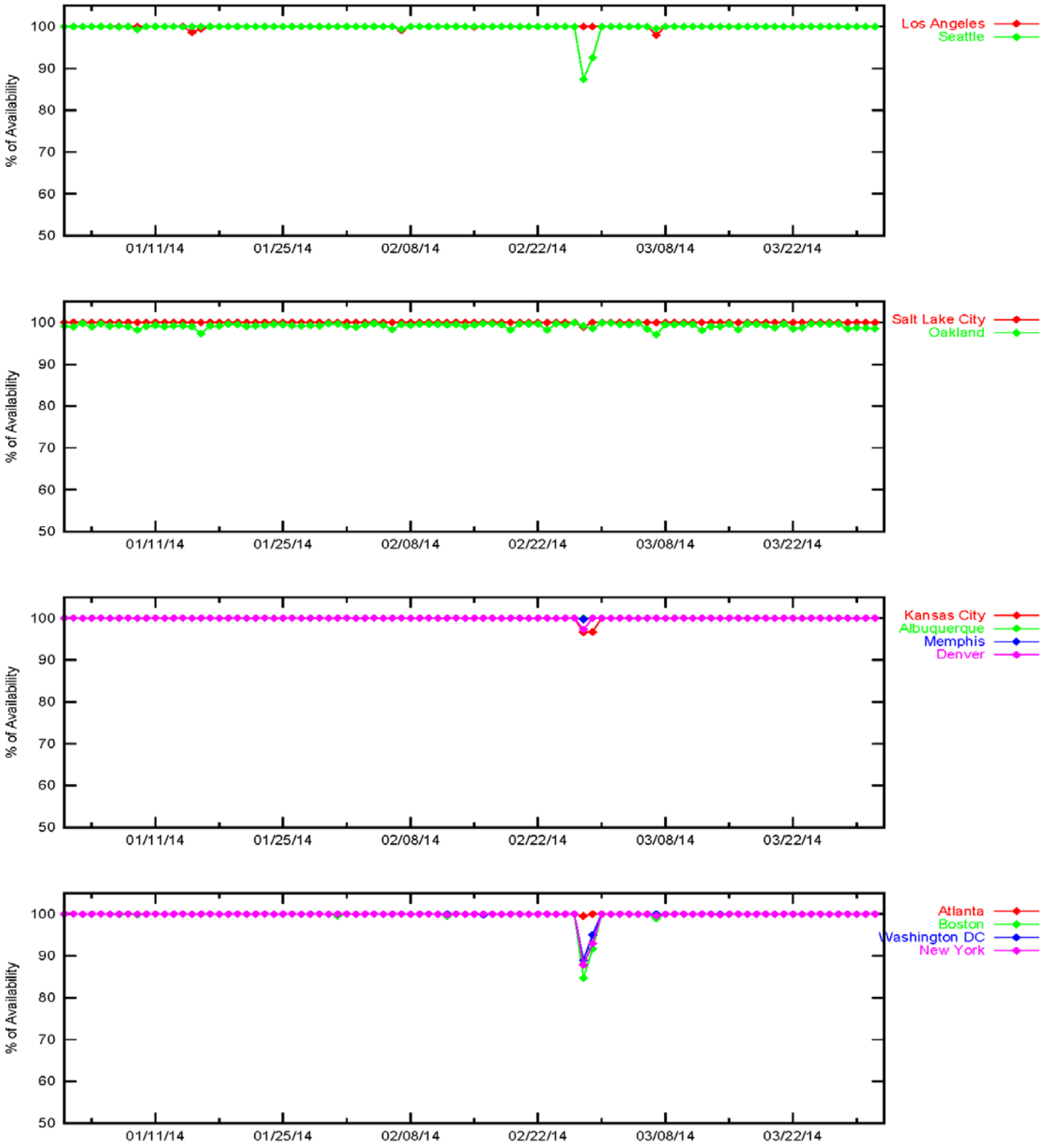


Figure 3-5 LPV 200 Instantaneous Availability

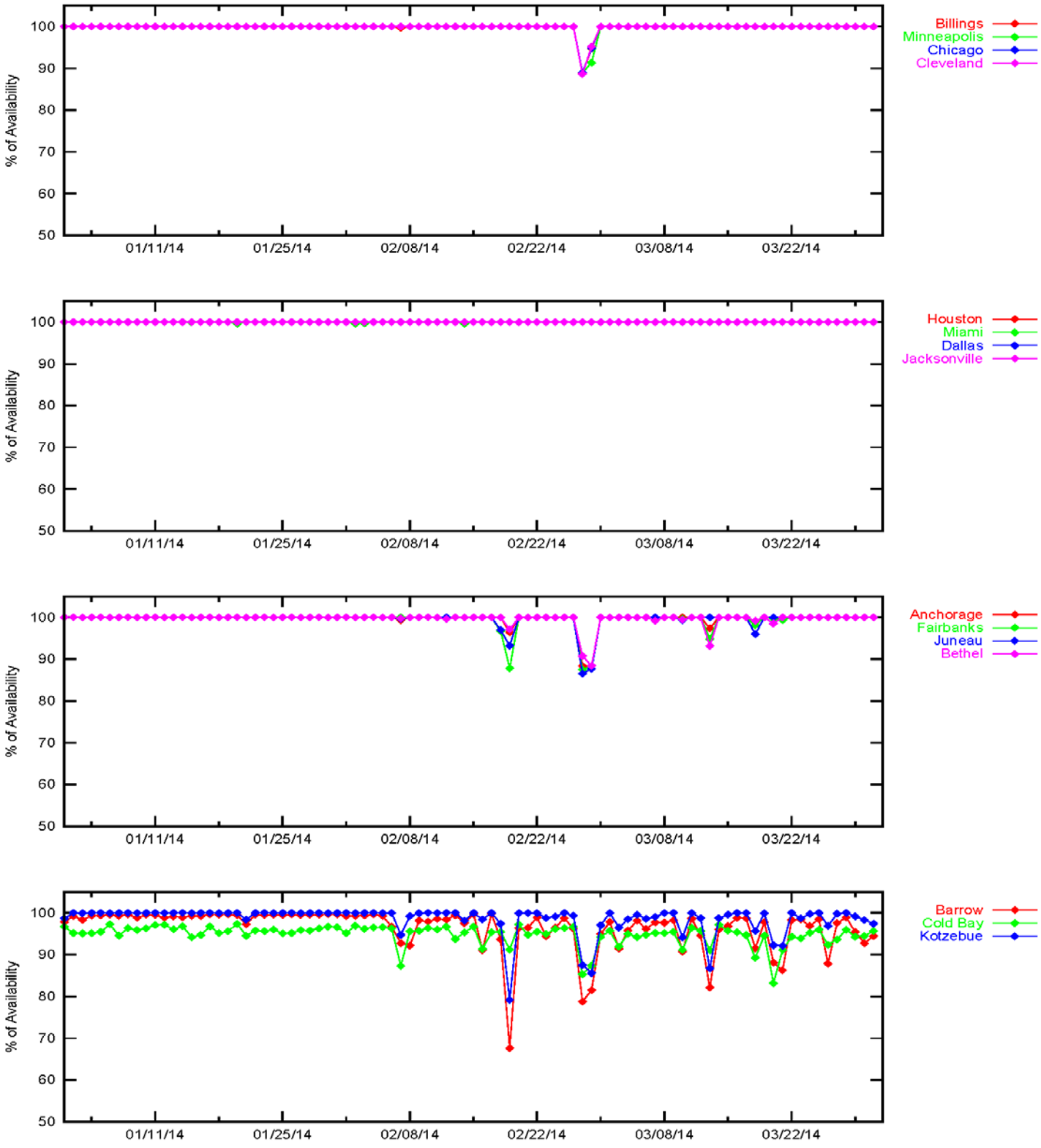


Figure 3-6 LPV 200 Instantaneous Availability

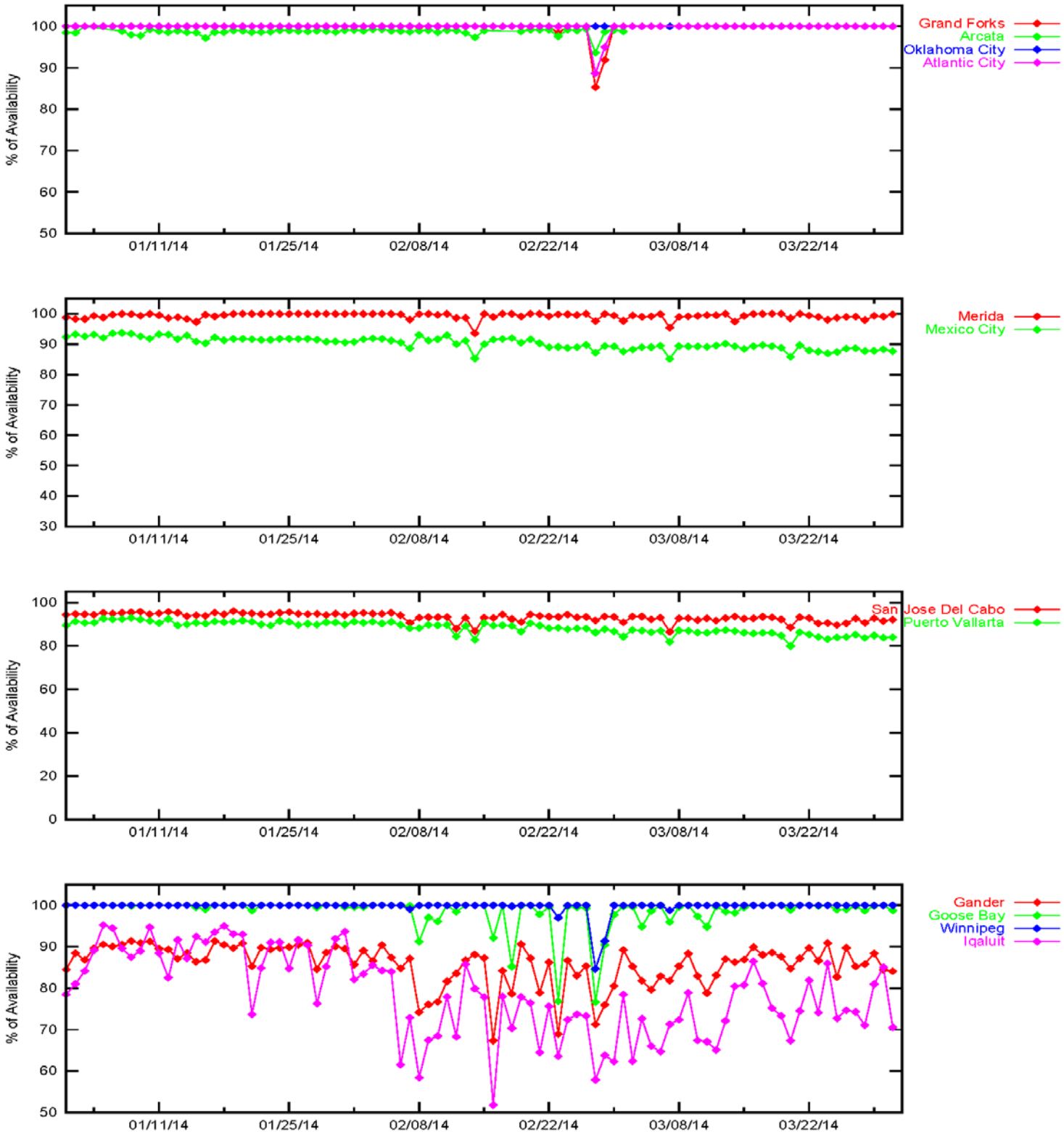


Figure 3-7 LPV Outages

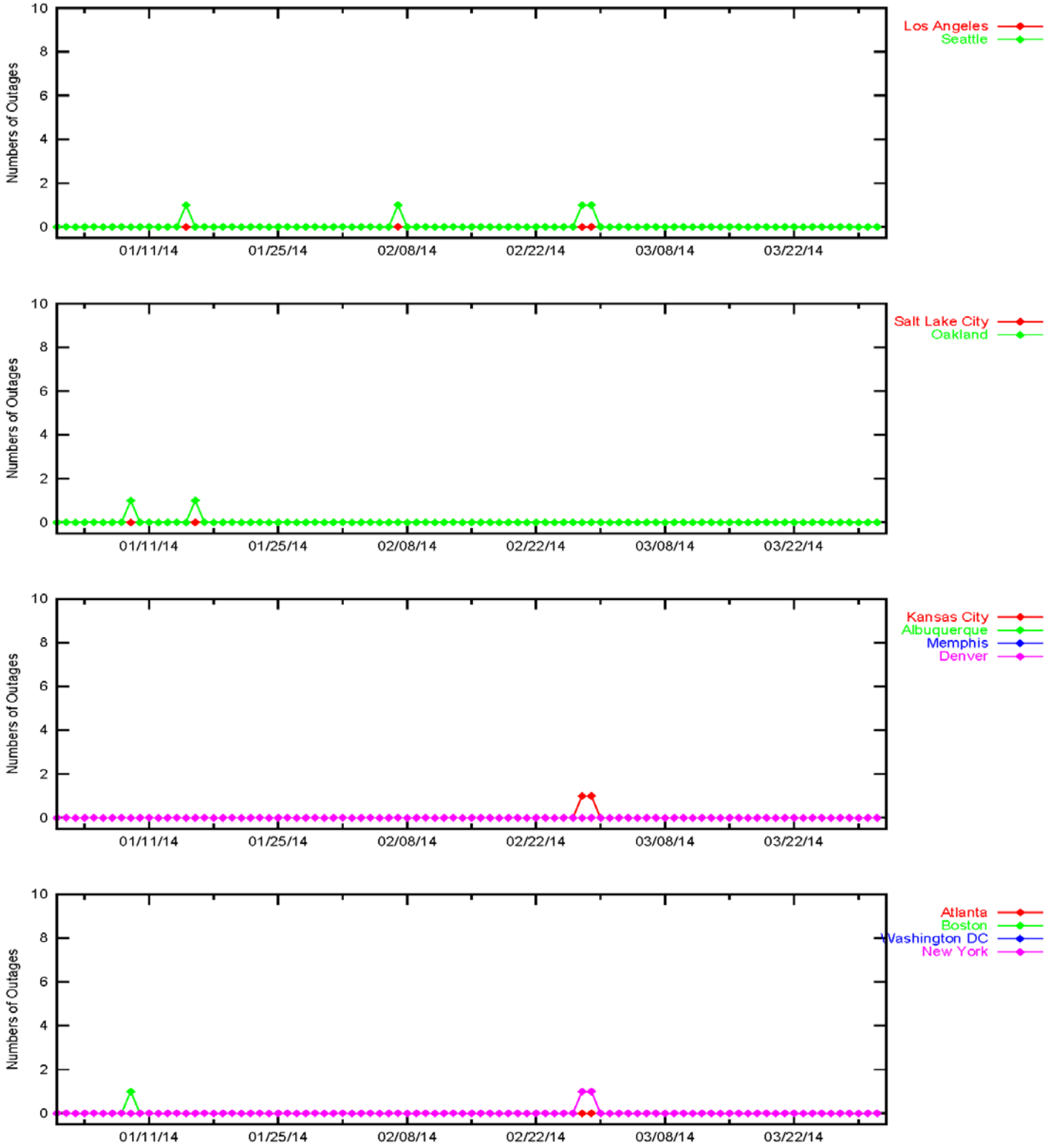


Figure 3-8 LPV Outages

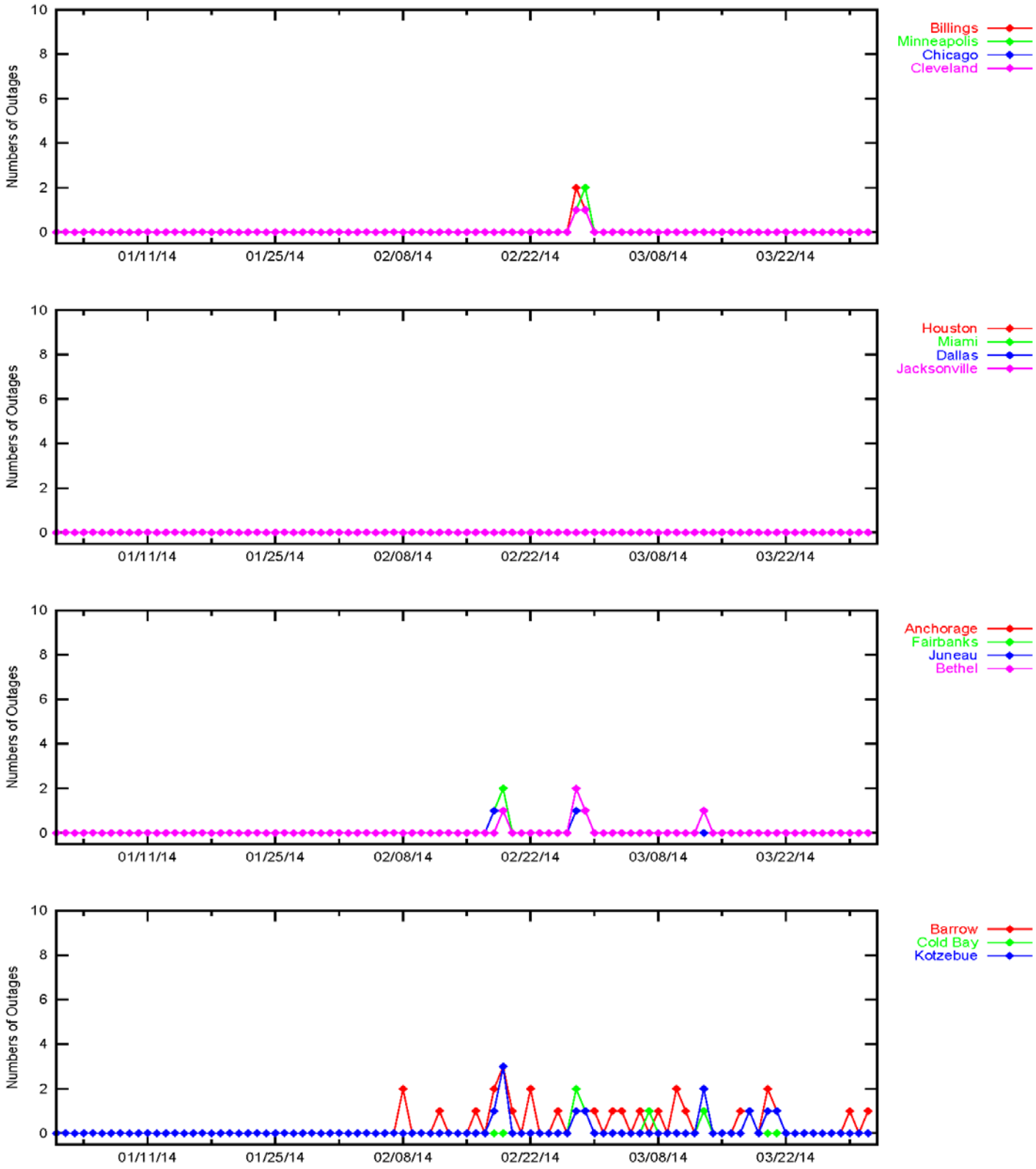


Figure 3-9 LPV Outages

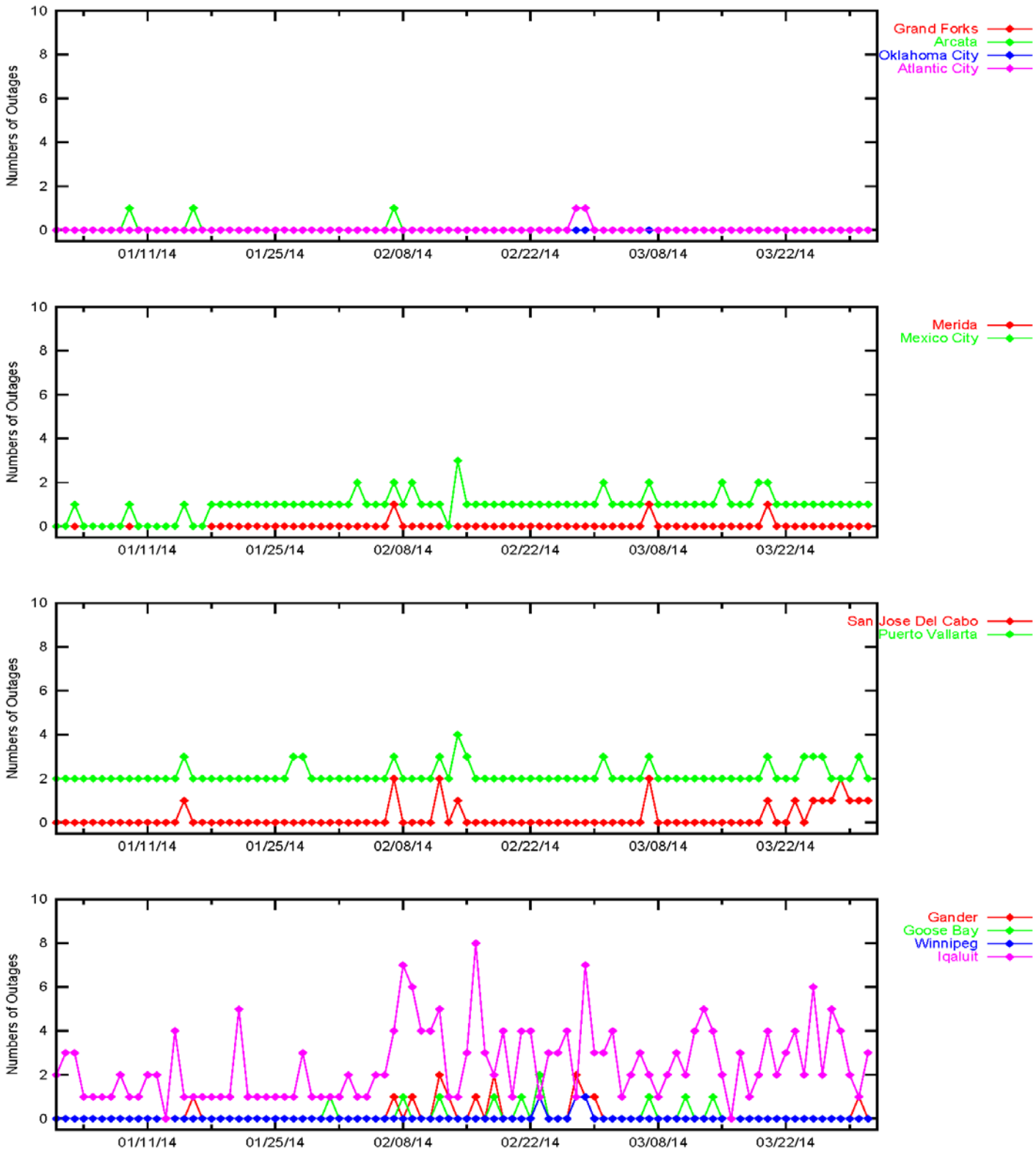


Figure 3-10 LPV 200 Outages

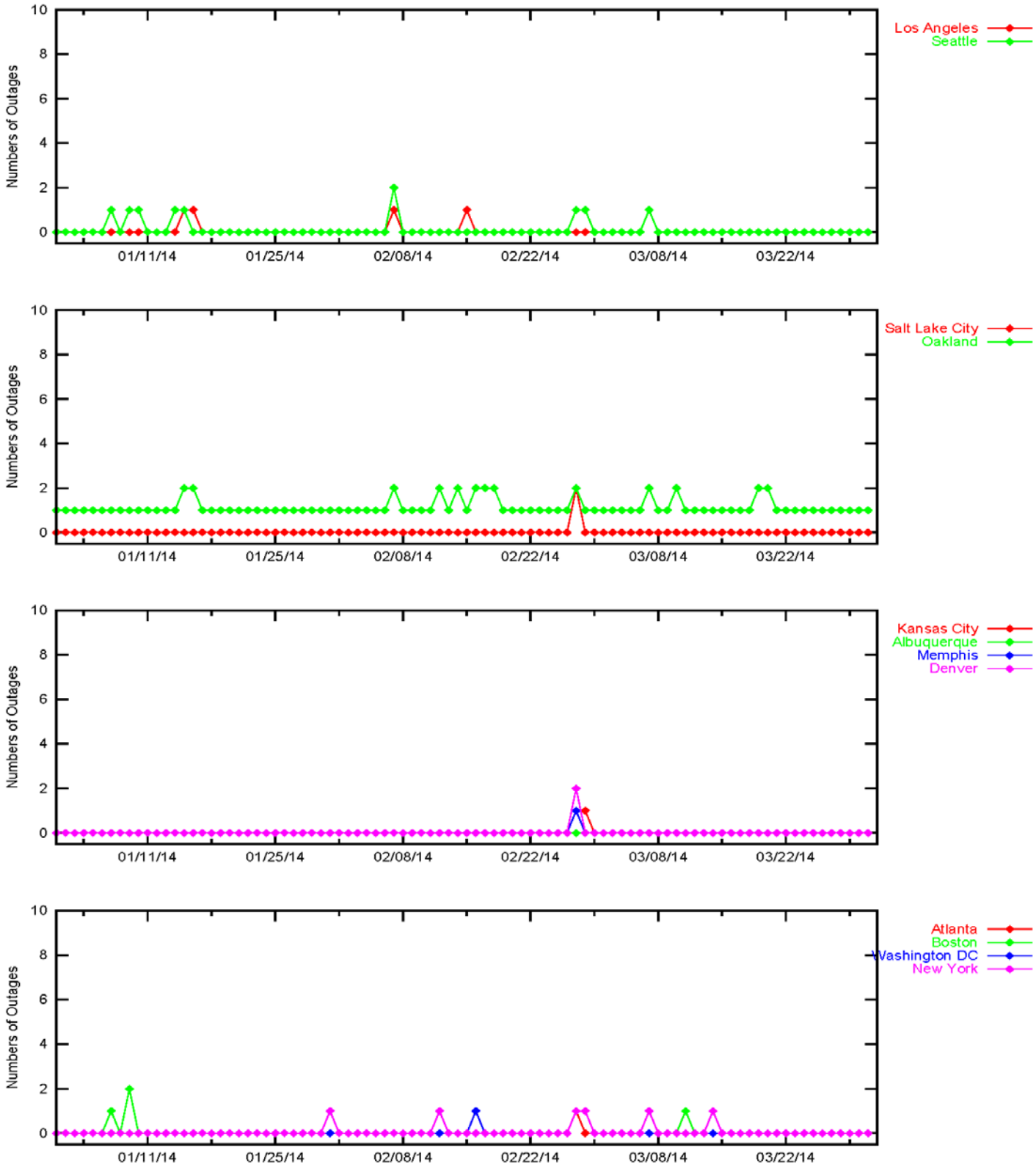


Figure 3-11 LPV 200 Outages

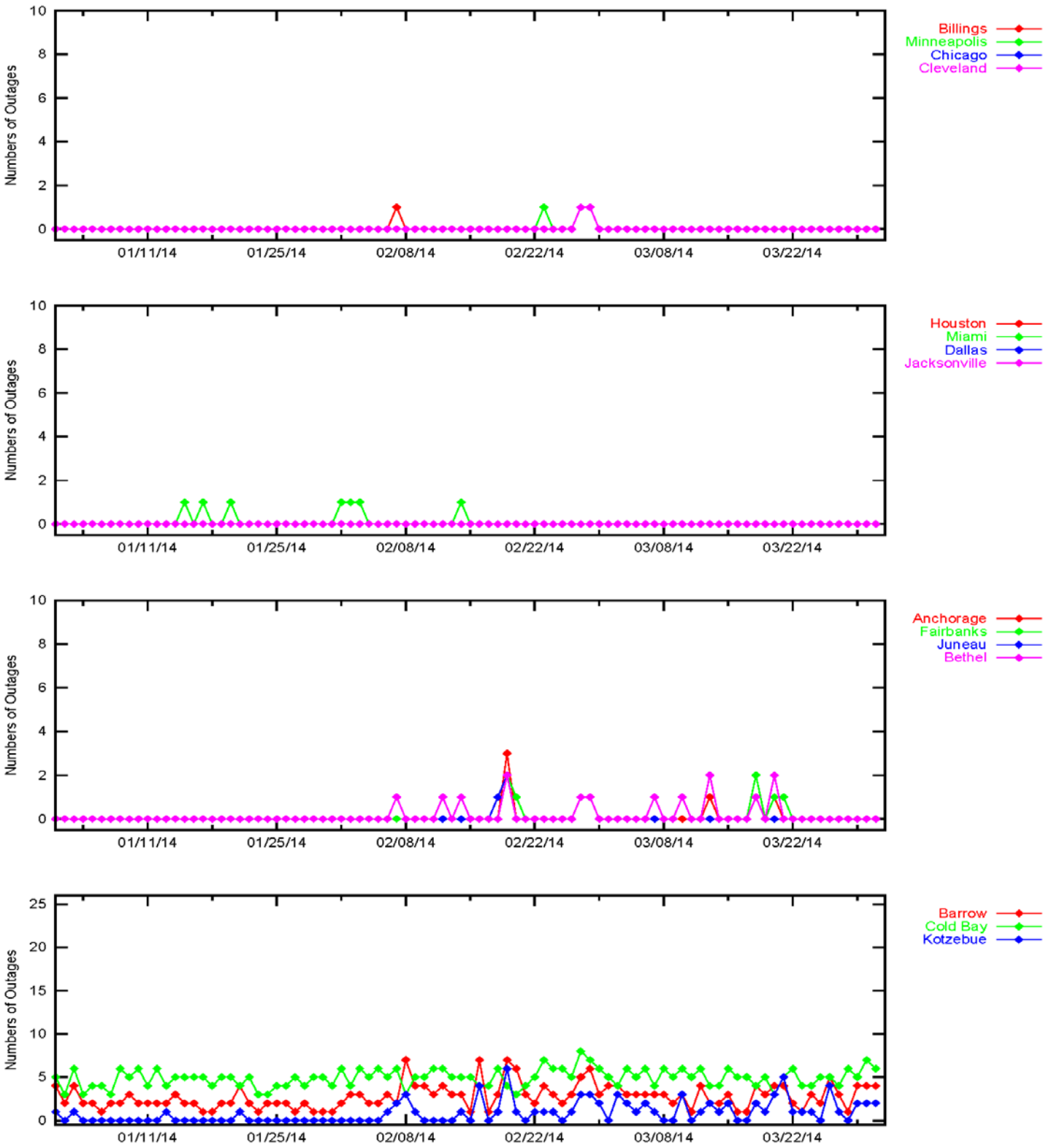
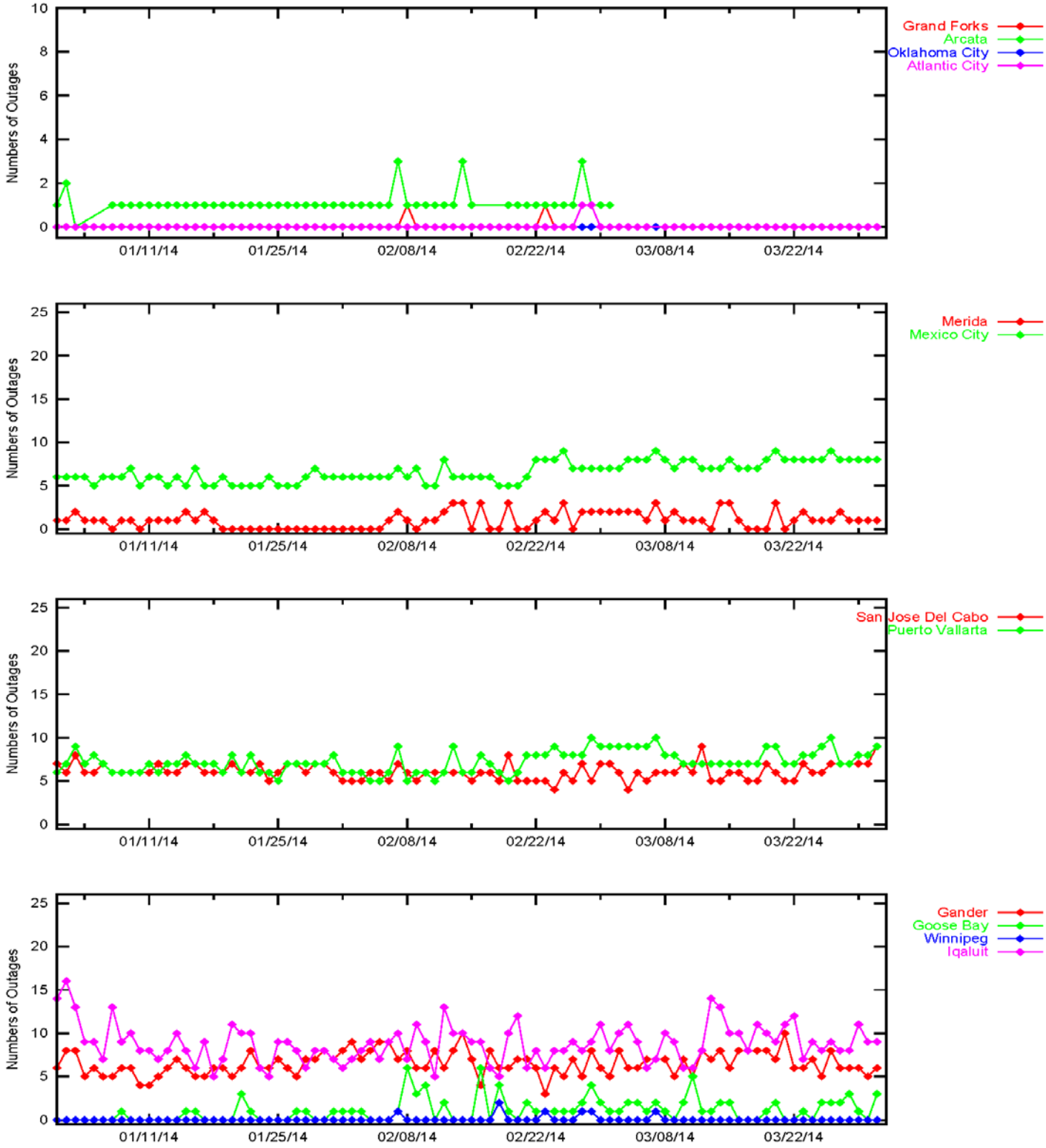


Figure 3-12 LPV 200 Outages



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

Manual GUS switchover on CRE GEO (PRN-138) on February 10 and February 12 along with geomagnetic activity elevated UDRE values and slightly reduced coverage in Alaska and Canada.

Numerous brief carrier phase anomalies were observed for this reporting period. These anomalies caused WAAS to issue SV alert setting to “Not Monitored” resulted in slight coverage reduction. Carrier phase anomalies on PRN-1 beginning on December 4 until February 3 resulted in minor reduction in LPV-200 CONUS coverage on multiple days; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63. Carrier phase anomalies on PRN-21 also occurred on multiple days: on January 15 resulted in a slight reduction in LPV-200 CONUS and Mexico coverage, on February 6 resulted in a small reduction in Alaska and Canada coverage, on March 14 resulted in a minor reduction in CONUS and Canada coverage, and on March 22 resulted in a little reduction in Alaska coverage. A carrier phase anomaly on PRN-32 on March 5 resulted in a slight reduction in LPV-200 Canada coverage and on PRN-4 on March 14 resulted in a minor reduction in Canada coverage.

Planned maintenance on PRN-19 on January 9 caused minor coverage reduction in CONUS. Planned maintenance on PRN-22 on January 16 slightly affected CONUS and Canada coverage. Planned maintenance on PRN-21 on February 7 resulted in a coverage reduction in CONUS, Alaska and Canada. Planned maintenance on PRN-2 on February 14 in combination with CCC monitor trips on CRE GEO (PRN-138) affected CONUS, Alaska and Canada coverage. Planned maintenance on PRN-16 on February 18 caused slight coverage drop in Alaska. Planned maintenance on PRN-5 on March 5 caused minor coverage reduction in Alaska. Planned maintenance on PRN-24 on March 20 affected Alaska and Canada coverage.

A planned maintenance on PRN-17 along with a PRN-25 carrier phase anomaly on March 7 contributed to the degradation of coverage; see DR 121 PRN17 NANU and SV Alert on PRN 25 Affect WAAS Coverage.

Geomagnetic activity on January 1, January 21, February 12-16, March 3-4, March 10, March 13, March 18, and March 26 elevated GIVE values and affected coverage in Alaska and Canada. Geomagnetic activity on February 19,

February 23 and February 27-28 elevated GIVE values and caused slight degradation in coverage in CONUS, Alaska and Canada. Geomagnetic activity on January 28, February 2, February 21, March 26, March 28, and March 31 elevated GIVE values and caused coverage drop in Canada. Geomagnetic activity in the equatorial region on March 10 resulted in "Do Not Use" alerts on PRN-4 and PRN-20; see DR 122 PRN4 and PRN20 DNU due to Iono Equator.

Communication outages at Goose Bay on January 15 increased GIVE values and caused coverage reduction in Canada. Communication outages at Goose Bay on February 9-11 along with geomagnetic activity increased GIVE values and caused coverage reduction in Canada. Communication outages at Kotzebue on February 26 and February 28 increased GIVE values and affected coverage in Alaska. Communication outages at Iqaluit on February 26 increased GIVE values and caused coverage drop in Canada. Communication outages at Barrow, Bethel, Fairbanks, and Kotzebue on March 12 in combination with geomagnetic activity increased GIVE values and affected coverage in Alaska; see DR 119 Geomagnetic Activity and Common WRS Communication Outages.

On March 21, an anomaly on PRN-25 ephemeris update was observed with no impact to coverage. PRN-25 ephemeris was updated without changing IODE and IODC; see DR 120 PRN25 Illegal IODE IODC.

Radio frequency interference (RFI) caused localized loss of LPV/LPV200 coverage at Boston on January 9, but had no effect on WAAS service.

Figure 4-1 LP North America Coverage for the Quarter

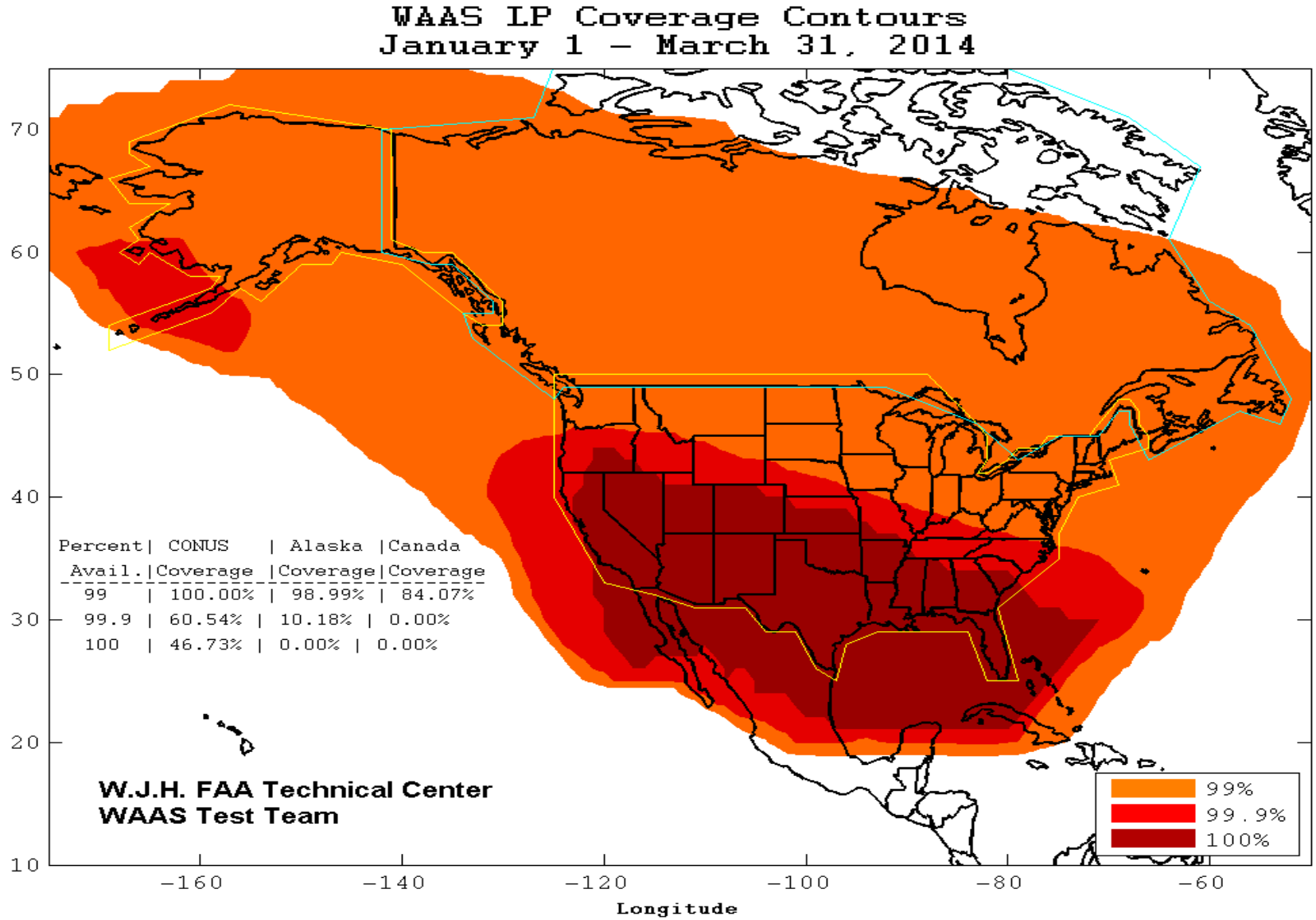


Figure 4-2 LPV North America Coverage for the Quarter

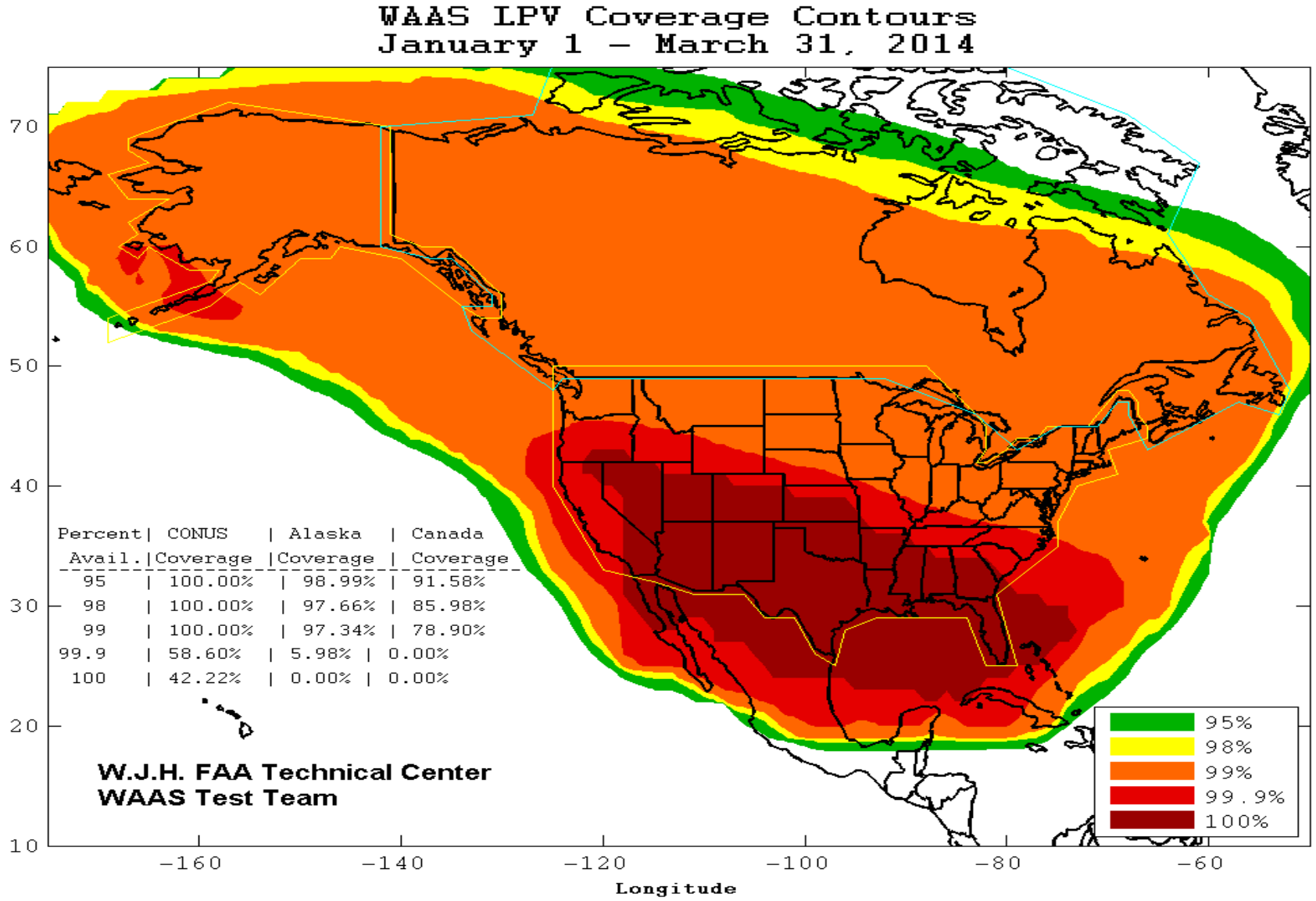


Figure 4-3 LPV 200 North America Coverage for the Quarter

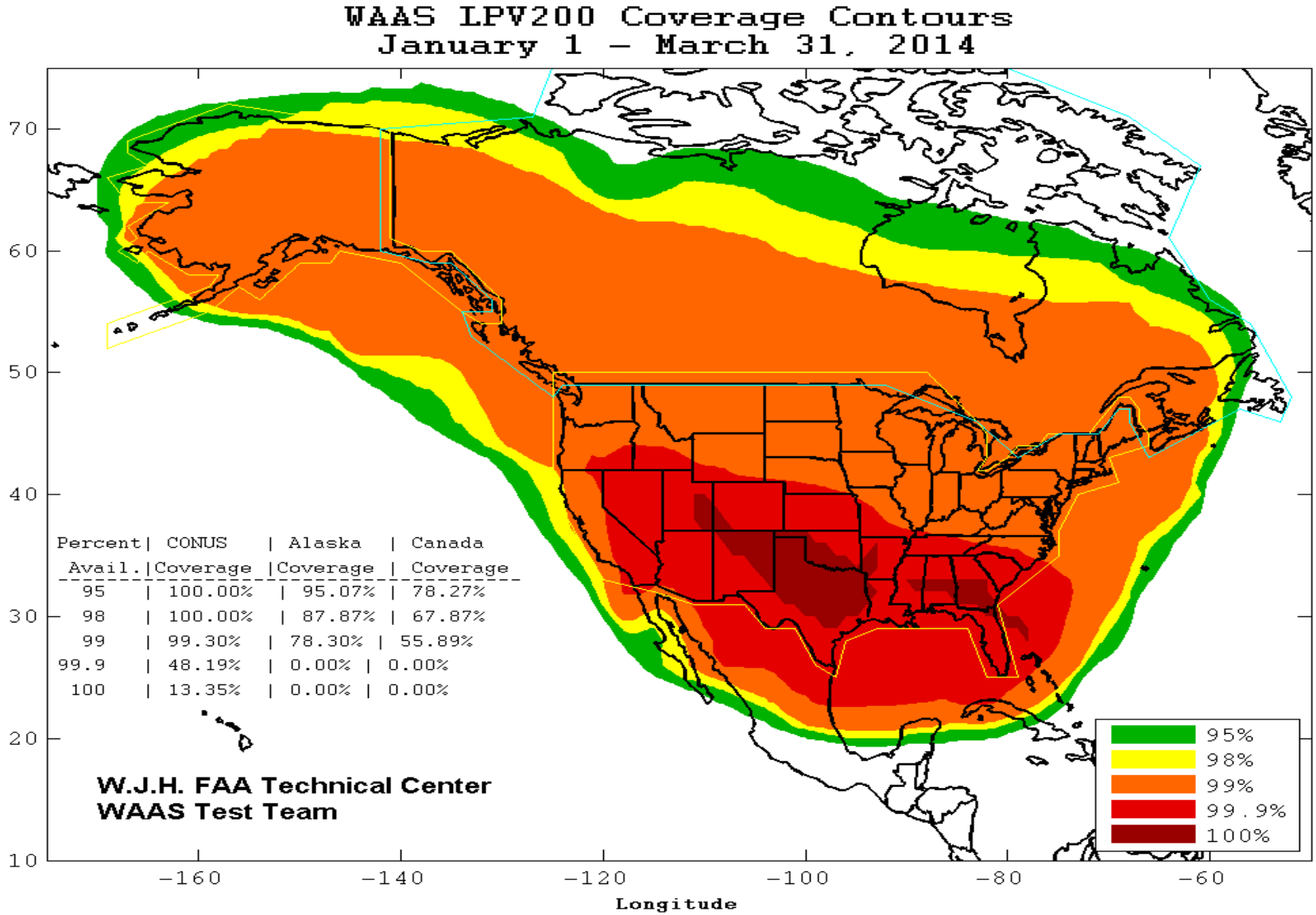


Figure 4-4 RNP 0.1 Coverage for the Quarter

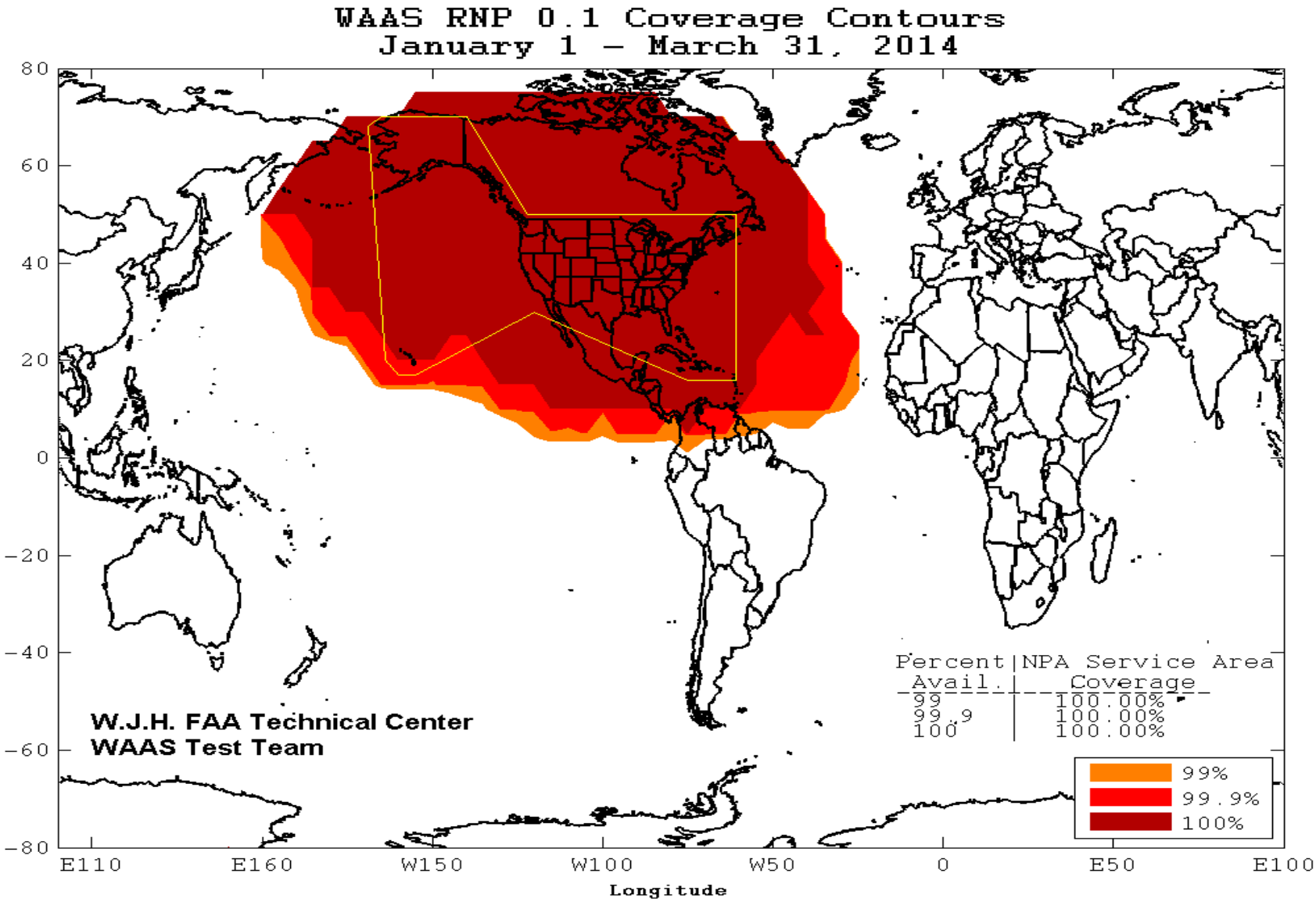


Figure 4-5 RNP 0.3 Coverage for the Quarter

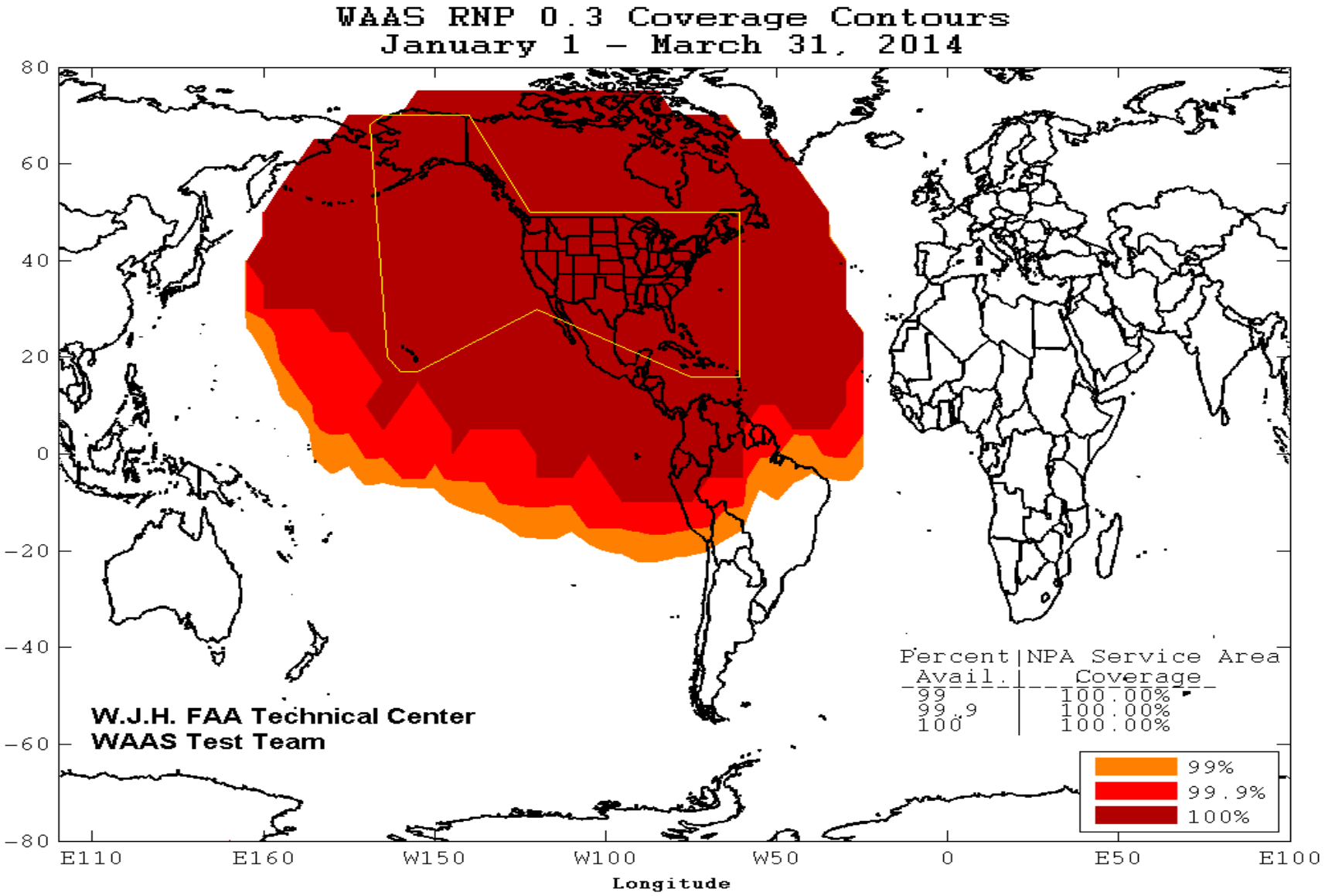


Figure 4-6 Daily LPV and LPV 200 CONUS Coverage

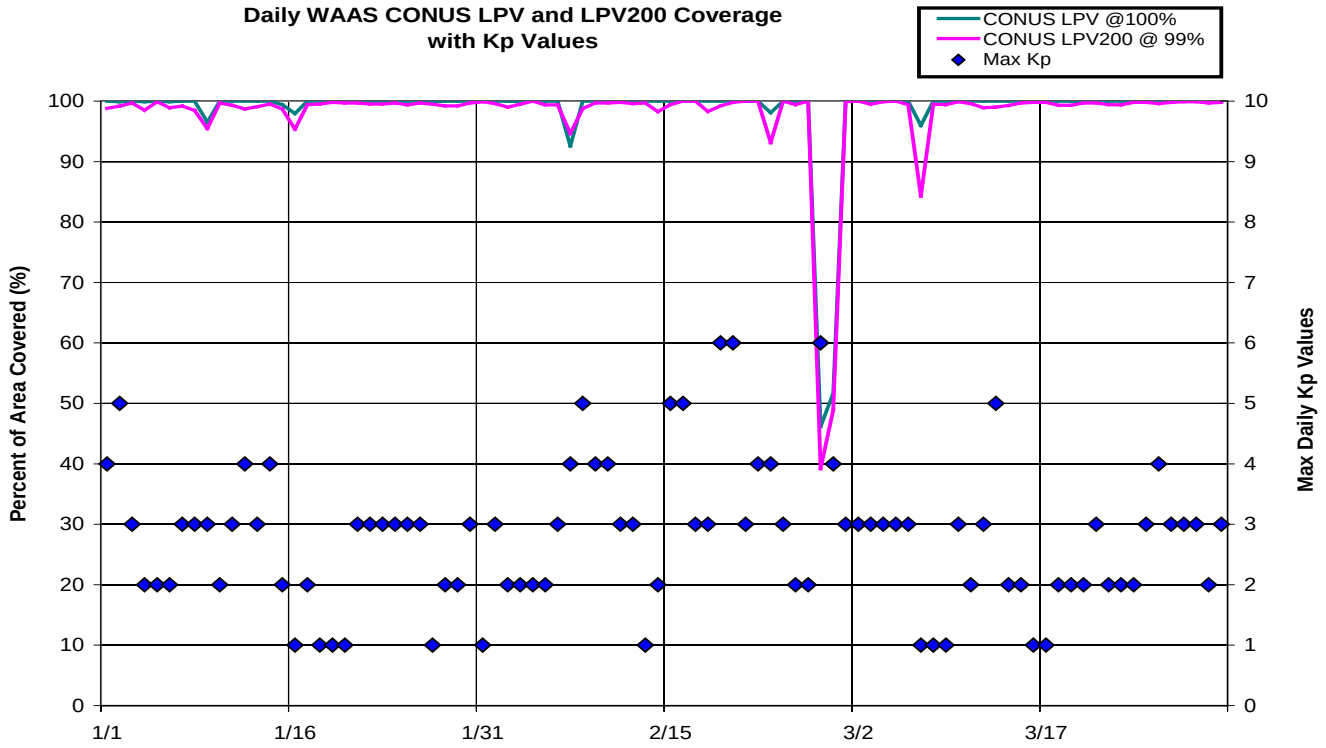


Figure 4-7 Daily LPV and LPV 200 Alaska Coverage

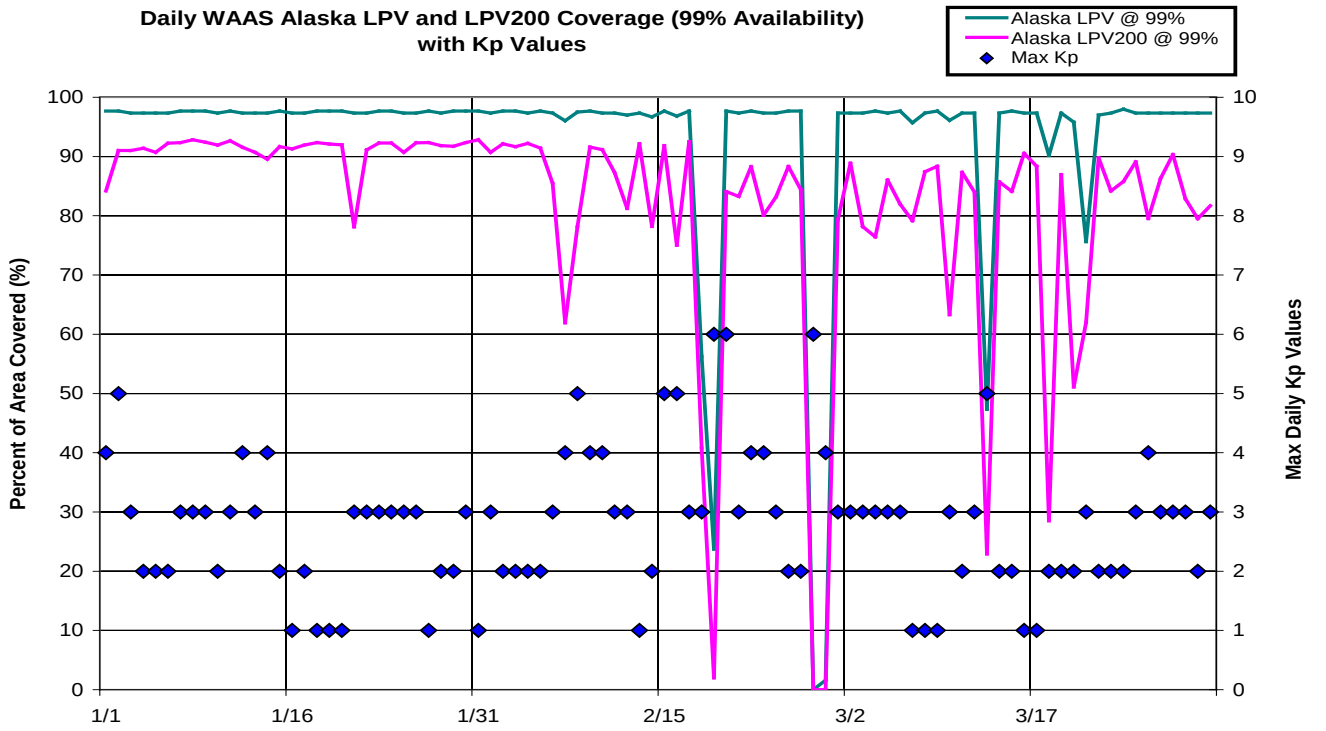


Figure 4-8 Daily LPV and LPV 200 Canada Coverage

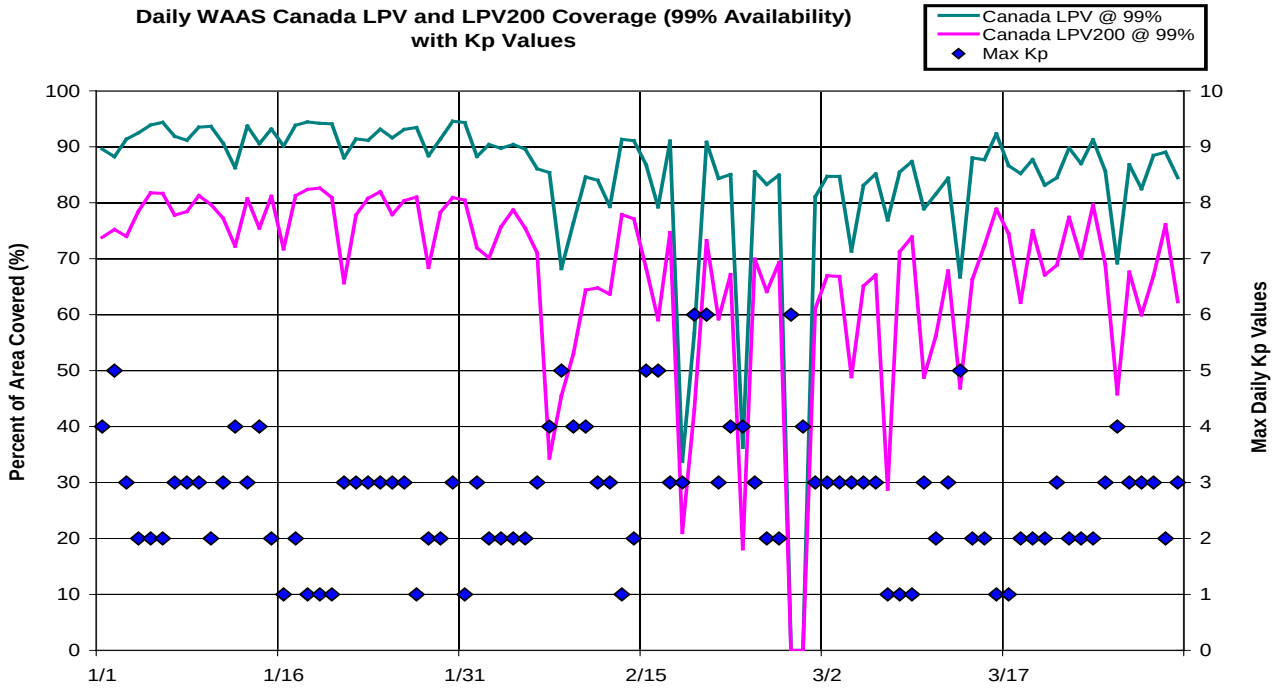
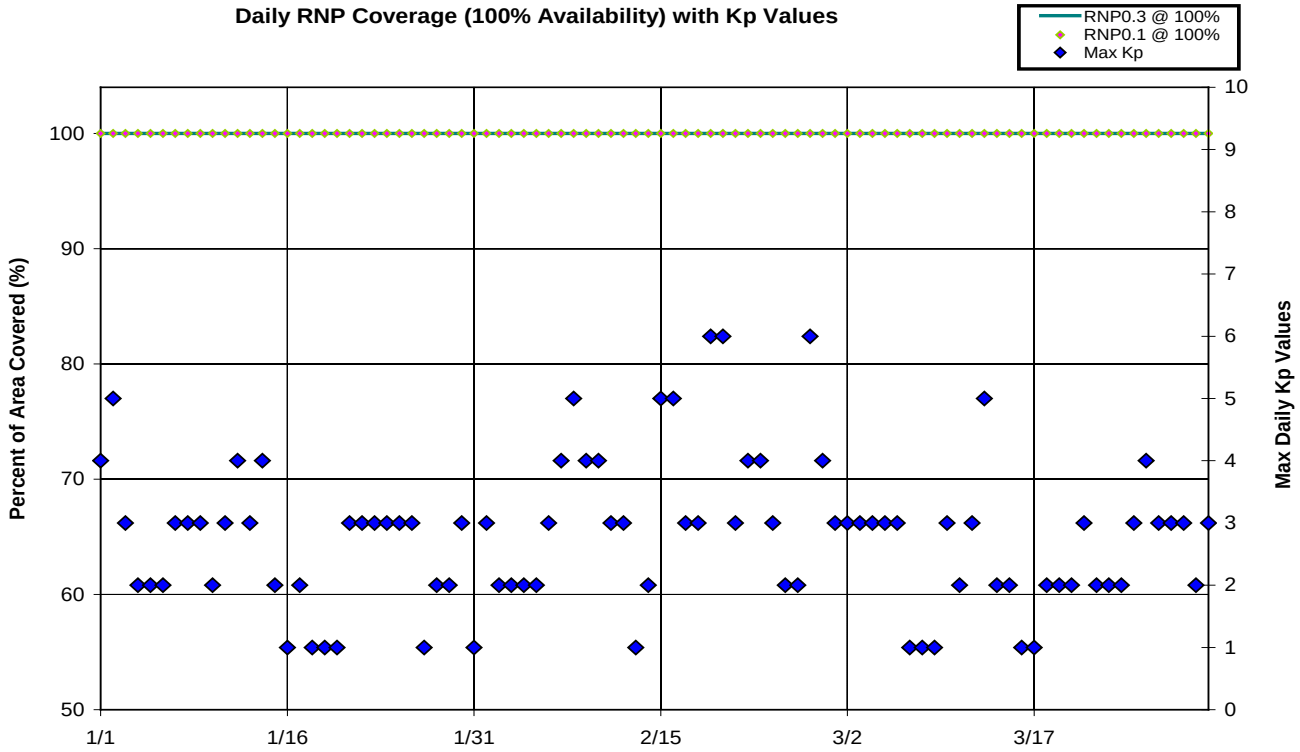


Figure 4-9 Daily RNP Coverage



5.0 INTEGRITY

5.1 HMI Analysis

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

Table 5-1 lists the safety index and the number of HMI events. For this evaluation period, the lowest safety margin index is 3.6 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 Minimum Safety Margin Index and HMI Statistics

Location	Safety Index		
	Horizontal	Vertical	Number of HMIs
Arcata	4.58	8.98	0
Atlantic City	3.81	11.28	0
Grand Forks	5.32	4.38	0
Oklahoma City	6.04	7.68	0
Albuquerque	6.22	6.13	0
Anchorage	15.34	10.42	0
Atlanta	7.87	7.64	0
Barrow	10.17	6.27	0
Bethel	16.73	7.85	0
Billings	5.26	8.87	0
Boston	7.45	7.14	0
Chicago	11.81	6.26	0
Cleveland	7.80	5.94	0
Cold Bay	13.23	9.39	0
Dallas	6.31	4.79	0
Denver	7.62	10.83	0
Fairbanks	9.65	3.60	0
Gander	10.34	7.46	0
Goose Bay	8.37	6.33	0
Houston	5.27	5.39	0
Iqaluit	8.48	6.34	0
Jacksonville	6.74	5.20	0
Juneau	5.94	5.65	0
Kansas City	11.11	7.20	0
Kotzebue	9.83	9.33	0
Los Angeles	7.69	6.59	0
Memphis	5.10	5.32	0
Merida	7.45	9.42	0
Mexico City	6.61	9.60	0
Miami	5.92	10.08	0
Minneapolis	7.92	9.73	0
New York	9.59	7.97	0
Oakland	6.92	6.87	0
Puerto Vallarta	6.17	6.47	0
Salt Lake City	5.52	8.33	0
San Jose Del Cabo	5.99	10.15	0
Seattle	5.79	8.58	0
Washington DC	6.69	11.46	0
Winnipeg	9.64	6.13	0

5.2 Broadcast Alerts

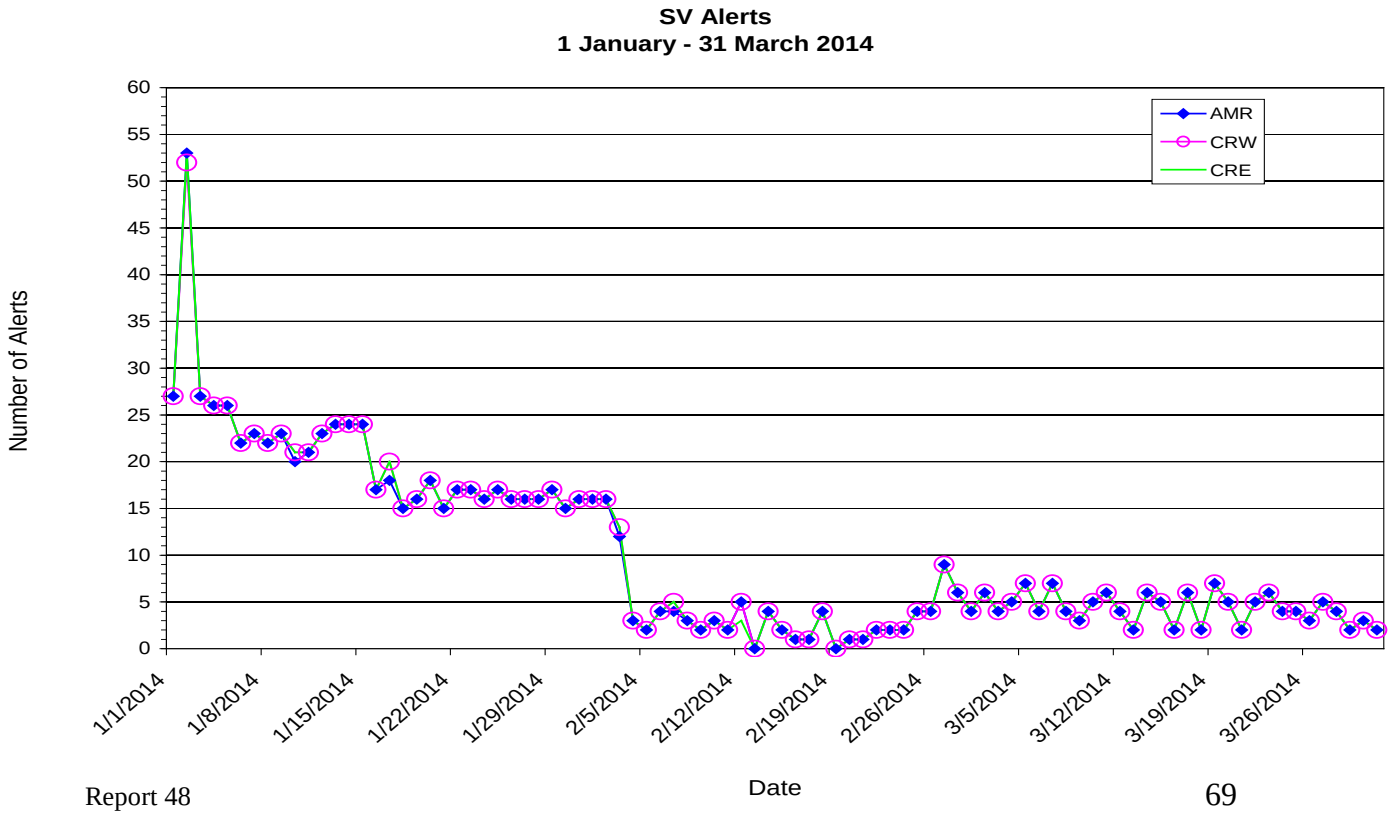
The WAAS transmits alert messages to protect the users if the active WAAS corrections are no longer bound by the UDREs. Alerts increase the User Differential Range Error (UDRE) for one or more PRNs, which can reduce the weighting of the satellite in the navigation solution, or completely exclude the 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.

The high average alerts for Message Type 2 in Table 5-2 is due to the PRN-1 anomaly; see DR 117.

Table 5-2 WAAS SV Alert

	Number of Alerts			Average Alerts Per Day		
Message Type	**AMR**	**CRW**	**CRE**	**AMR**	**CRW**	**CRE**
2	637	637	637	7.0778	7.0778	7.0778
3	64	64	64	0.7111	0.7111	0.7111
4	195	199	198	2.1667	2.2111	2.2000
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	896	900	899	9.9556	10.0000	9.9889
Days in Service	90	90	90			

Figure 5-1 SV Daily Alert Trend



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

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

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

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

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

Table 5-3 Update Rates for WAAS Messages

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

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

Message Type	On Time	Late	Max Late Length (seconds)
1	105932	3	126
2	1297505	187	14
3	1295257	583	14
4	1295766	528	12
7	98173	32	159
9	91053	0	0
10	98218	23	128
17	30988	1	305

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

SV	On Time	Late	Max Late Length (seconds)
1	45765	0	0
2	46099	0	0
3	47279	0	0
4	46500	0	0
5	46821	1	162
6	27945	0	0
7	46319	1	181
8	46271	1	170
9	45771	0	0
10	47914	1	172
11	48741	2	181
12	46682	0	0
13	46223	0	0
14	46337	0	0
15	46399	0	0
16	46909	0	0
17	45528	1	174
18	45725	0	0
19	47708	1	180
20	47875	2	180
21	46243	1	179
22	45458	0	0
23	46499	0	0
24	48067	0	0
25	47993	1	172
26	47319	1	170
27	48443	0	0
28	46477	0	0
29	46488	0	0
31	47249	0	0
32	46180	1	174

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

SV	On Time	Late	Max Late Length (seconds)
1	37650	1	184
2	37863	0	0
3	38783	0	0
4	38181	0	0
5	38416	0	0
6	22962	0	0
7	38001	0	0
8	38072	1	206
9	37555	0	0
10	39319	0	0
11	40089	0	0
12	38311	0	0
13	37989	2	209
14	38043	0	0
15	38051	0	0
16	38529	0	0
17	37412	0	0
18	37543	1	211
19	39168	0	0
20	39319	1	206
21	37977	0	0
22	37336	0	0
23	38208	0	0
24	39534	0	0
25	39385	2	211
26	38865	0	0
27	39826	1	211
28	38120	0	0
29	38217	0	0
31	38739	2	209
32	37880	0	0
133	74232	2	211
135	74741	1	206
138	74313	1	4110

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	26893	26	308
0	1	26910	16	310
0	2	26900	22	306
1	0	26897	17	307
1	1	26890	23	576
1	2	26913	13	308
1	3	26893	25	310
1	4	26889	32	579
2	0	26883	22	576
2	1	26900	22	306
2	2	26893	17	308
2	3	26907	19	311
2	4	26894	24	306
3	0	26880	26	306
3	1	26901	21	318
3	2	26896	28	576
9	0	26898	20	310
9	1	26901	18	306
9	2	26890	19	580
9	3	26896	17	582
9	4	26889	21	311
9	5	26889	24	577
9	6	26895	27	310

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

Band	On Time	Late	Max Late Length (seconds)
0	35325	0	0
1	35346	0	0
2	35332	0	0
3	35322	0	0
9	35327	1	383

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

Message Type	On Time	Late	Max Late Length (seconds)
1	106448	4	127
2	1297532	176	10
3	1295280	575	10
4	1295774	524	10
7	98633	33	139
9	91056	0	0
10	98474	23	145
17	30994	5	330

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

SV	On Time	Late	Max Late Length (seconds)
1	45764	0	0
2	46112	0	0
3	47276	0	0
4	46502	0	0
5	46829	0	0
6	27943	0	0
7	46318	0	0
8	46273	0	0
9	45773	0	0
10	47935	0	0
11	48748	0	0
12	46684	0	0
13	46226	0	0
14	46345	0	0
15	46402	0	0
16	46924	0	0
17	45526	0	0
18	45721	0	0
19	47718	0	0
20	47882	0	0
21	46249	0	0
22	45441	0	0
23	46517	0	0
24	48063	0	0
25	47995	0	0
26	47322	0	0
27	48445	0	0
28	46485	0	0
29	46498	0	0
31	47255	0	0
32	46173	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	37652	0	0
2	37875	0	0
3	38789	0	0
4	38191	0	0
5	38423	0	0
6	22966	0	0
7	38002	0	0
8	38084	0	0
9	37556	0	0
10	39318	0	0
11	40096	0	0
12	38312	0	0
13	37988	0	0
14	38048	0	0
15	38050	0	0
16	38529	0	0
17	37412	0	0
18	37541	0	0
19	39168	0	0
20	39322	0	0
21	37987	0	0
22	37335	0	0
23	38204	0	0
24	39537	0	0
25	39391	0	0
26	38866	0	0
27	39840	0	0
28	38129	0	0
29	38221	0	0
31	38742	0	0
32	37885	0	0
133	74238	0	0
135	74743	0	0
138	74317	1	4115

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	26911	19	310
0	1	26898	23	307
0	2	26906	19	306
1	0	26903	14	306
1	1	26913	16	308
1	2	26886	19	306
1	3	26911	19	306
1	4	26891	19	308
2	0	26910	20	306
2	1	26907	19	307
2	2	26888	22	306
2	3	26888	30	318
2	4	26903	23	307
3	0	26910	20	311
3	1	26892	22	308
3	2	26903	19	308
9	0	26898	24	309
9	1	26889	21	306
9	2	26907	19	310
9	3	26905	17	309
9	4	26906	20	306
9	5	26910	16	306
9	6	26893	20	308

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

Band	On Time	Late	Max Late Length (seconds)
0	35394	0	0
1	35354	0	0
2	35358	0	0
3	35365	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	106366	6	132
2	1297525	179	18
3	1295273	578	18
4	1295767	528	21
7	98648	16	132
9	91057	0	0
10	98631	20	133
17	31049	1	301

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

SV	On Time	Late	Max Late Length (seconds)
1	45753	0	0
2	46109	0	0
3	47280	1	179
4	46494	2	186
5	46820	0	0
6	27944	0	0
7	46317	0	0
8	46276	0	0
9	45773	0	0
10	47930	0	0
11	48752	0	0
12	46682	0	0
13	46216	2	166
14	46340	0	0
15	46403	0	0
16	46916	0	0
17	45527	0	0
18	45723	1	171
19	47717	1	186
20	47881	0	0
21	46243	0	0
22	45447	0	0
23	46516	0	0
24	48067	0	0
25	47998	0	0
26	47320	0	0
27	48453	0	0
28	46484	0	0
29	46488	2	166
31	47253	0	0
32	46173	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	37648	0	0
2	37871	1	210
3	38784	0	0
4	38187	0	0
5	38412	0	0
6	22959	0	0
7	38003	0	0
8	38058	0	0
9	37560	0	0
10	39307	0	0
11	40061	0	0
12	38305	1	208
13	37982	0	0
14	38089	0	0
15	38045	0	0
16	38530	0	0
17	37403	0	0
18	37545	0	0
19	39169	0	0
20	39337	0	0
21	37980	0	0
22	37343	0	0
23	38189	0	0
24	39532	0	0
25	39387	1	208
26	38878	0	0
27	39853	1	210
28	38132	0	0
29	38201	0	0
31	38758	0	0
32	37902	0	0
133	74306	0	0
135	74692	0	0
138	74287	1	4121

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	26906	20	308
0	1	26905	17	311
0	2	26901	25	308
1	0	26913	17	310
1	1	26903	19	311
1	2	26899	19	311
1	3	26900	18	308
1	4	26904	14	307
2	0	26905	17	311
2	1	26895	23	307
2	2	26915	19	306
2	3	26915	11	308
2	4	26897	13	307
3	0	26902	17	311
3	1	26906	21	310
3	2	26888	23	305
9	0	26895	24	310
9	1	26903	23	306
9	2	26906	16	312
9	3	26921	13	313
9	4	26904	18	306
9	5	26900	10	307
9	6	26900	18	312

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

Band	On Time	Late	Max Late Length (seconds)
0	35389	0	0
1	35396	0	0
2	35413	0	0
3	35424	1	420
9	35389	0	0

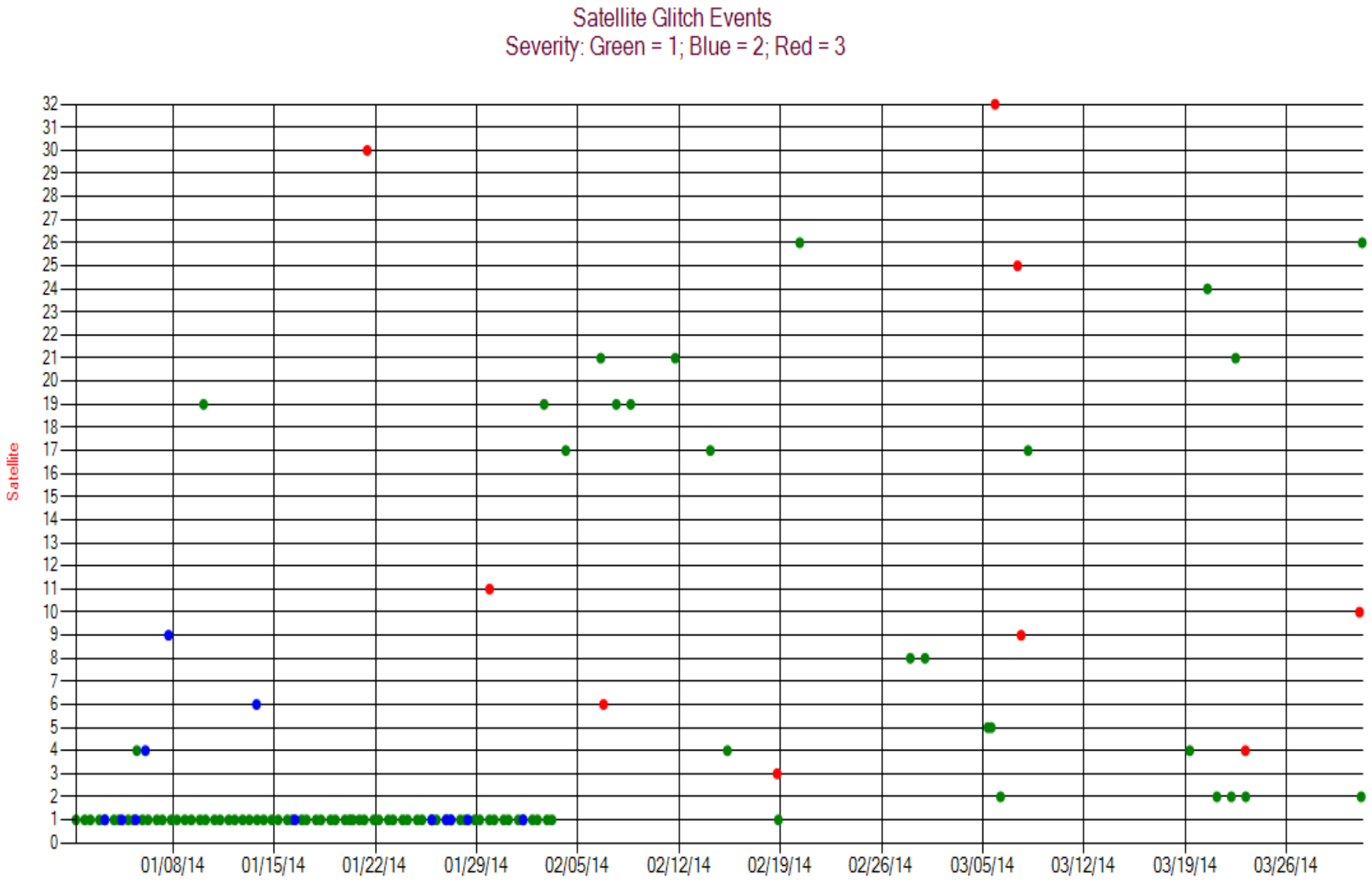
5.4 Satellite Glitches

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

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

Numerous glitches were observed on PRN-1 from 12/4/13 to 2/4/14; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63.

Figure 5-2 SV Glitch Trend



6.0 SV RANGE ACCURACY

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

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

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

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

For this reporting period, most satellites range errors were bounded 99.9% of the time by UDRE. The unbounded range errors on PRN-1 were due to numerous alerts on PRN-1; see DR 117 Excessive Not Monitored Alarms on PRN 1 SVN 63. The unbounded range errors of the following PRNs were due to geomagnetic activity: 1, 2, 4, 10, 13, 16, 19, 20, 22, 23, 25, 31, and 32. All other unbounded errors were due to geomagnetic activity and 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	2.851	100	3.079	100	3.051	100	2.446	100	2.356	100	2.675	100
2	1.935	100	2.313	100	1.859	100	2.470	100	3.304	99.9874	3.192	100
3	1.751	100	1.767	100	1.099	100	0.978	100	1.014	100	1.095	100
4	1.867	100	1.166	100	1.619	100	1.187	100	1.298	100	2.914	100
5	1.758	100	1.668	100	1.926	100	1.401	100	1.275	100	2.047	100
6	1.711	100	1.464	100	1.283	100	1.130	100	1.036	100	1.252	100
7	1.283	100	1.068	100	1.692	100	0.954	100	1.171	100	1.072	100
8	1.030	100	0.881	100	1.458	100	1.418	100	1.520	100	1.309	100
9	2.088	100	1.572	100	1.551	100	1.847	100	1.462	100	1.772	100
10	0.956	100	0.859	100	1.039	100	1.182	100	1.966	100	1.307	100
11	0.904	100	0.882	100	1.216	100	1.411	100	2.160	100	1.337	100
12	1.625	100	1.210	100	1.277	100	1.193	100	1.484	100	1.405	100
13	1.582	100	1.634	100	1.284	100	1.114	100	1.728	100	1.155	100
14	1.988	100	0.944	100	1.197	100	1.371	100	1.563	100	1.066	100
15	1.577	100	1.468	100	1.826	100	1.367	100	1.751	100	1.462	100
16	1.085	100	1.111	100	0.989	100	1.589	100	1.895	100	1.234	100
17	1.794	100	0.967	100	1.440	100	0.879	100	1.791	100	1.271	100
18	0.989	100	1.043	100	1.339	100	1.667	100	1.894	100	1.255	100
19	2.229	100	1.875	100	2.570	100	2.852	100	3.208	100	2.174	100
20	1.039	100	1.434	100	1.350	100	1.820	99.9993	1.933	100	1.472	100
21	1.151	100	1.418	100	1.200	100	1.523	100	1.580	100	1.328	100
22	1.751	100	2.139	100	2.509	100	2.739	100	2.768	100	2.269	100
23	1.379	99.9756	1.698	100	2.298	100	2.178	100	2.951	99.9974	1.643	100
24	3.018	100	2.879	100	2.928	100	2.502	100	3.128	100	2.705	100
25	2.812	99.9869	3.060	100	2.282	99.9950	2.193	100	3.190	100	2.629	100
26	1.708	100	1.363	100	1.670	100	1.300	100	1.457	100	1.566	100
27	2.507	100	2.143	100	2.336	100	2.116	100	1.934	100	2.172	100
28	1.943	100	1.185	100	1.412	100	1.559	100	2.047	100	1.371	100
29	2.001	100	1.704	100	1.407	100	1.632	100	1.228	100	1.659	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	2.250	100	1.178	100	0.863	100	0.988	100	1.301	100	1.616	100
32	1.211	100	1.218	100	1.168	100	1.018	100	1.797	100	1.052	100
135	2.172	100	1.860	100	2.231	100	1.807	100	2.544	100	1.294	100
138	1.442	100	1.258	100	1.614	100	1.744	100	1.485	100	1.953	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	2.512	100	3.277	99.9997	2.094	100	2.954	99.9923	2.358	100	2.884	99.9180
2	2.495	100	1.951	100	2.652	100	2.076	100	2.537	100	1.936	99.9616
3	2.020	100	2.004	100	1.162	100	1.303	100	0.947	100	1.655	100
4	1.303	100	1.747	100	1.425	100	1.455	100	1.240	100	1.739	99.9961
5	1.484	100	1.696	100	1.332	100	1.655	100	1.357	100	1.890	100
6	1.375	100	2.117	100	0.947	100	1.244	100	1.089	100	1.484	100
7	1.166	100	1.628	100	2.059	100	1.269	100	0.776	100	1.830	100
8	1.009	100	1.133	100	0.995	100	1.427	100	1.193	100	1.478	100
9	1.262	100	2.237	100	1.255	100	1.351	100	1.198	100	1.992	100
10	0.788	100	0.904	100	1.428	100	0.836	100	1.437	100	1.187	99.9777
11	0.984	100	1.211	100	2.626	100	1.352	100	1.547	100	1.180	100
12	0.859	100	1.258	100	1.025	100	1.117	100	0.960	100	1.610	100
13	0.950	100	2.002	100	1.266	100	1.242	100	1.036	100	1.365	99.9928
14	0.831	100	0.871	100	1.436	100	0.885	100	1.391	100	1.069	100
15	1.510	100	1.556	100	1.328	100	1.680	100	1.385	100	1.739	100
16	1.336	100	1.077	100	1.518	100	1.418	99.9602	1.737	100	1.063	100
17	0.977	100	1.318	100	1.304	100	1.082	100	1.132	100	1.400	100
18	1.147	100	1.143	100	1.561	100	1.170	100	1.735	100	1.261	100
19	2.302	100	2.059	100	3.141	100	1.995	100	3.095	100	2.163	100
20	1.055	100	1.309	100	1.921	100	1.576	99.9895	2.004	100	1.161	99.9997
21	0.947	100	0.826	100	2.184	100	0.911	100	1.509	100	1.144	100
22	2.020	100	1.941	100	2.849	99.9275	2.233	100	2.894	99.9893	2.176	100
23	1.603	100	1.594	100	2.280	100	1.597	99.9364	2.369	100	1.627	100
24	2.678	100	3.751	99.4738	2.543	100	2.713	100	2.494	100	3.171	100
25	2.345	100	2.213	100	2.209	100	2.194	100	1.736	100	2.878	100
26	1.402	100	1.557	100	1.090	100	1.649	100	1.128	100	1.697	100
27	2.657	100	2.399	100	1.597	100	2.660	100	1.795	100	2.579	100
28	1.231	100	0.900	100	2.560	100	0.972	100	1.693	100	1.085	100
29	1.147	100	2.241	100	1.371	100	1.716	100	1.132	100	2.062	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	1.295	100	1.636	100	1.624	100	0.952	100	1.160	100	1.663	100
32	0.873	100	1.688	100	1.028	100	0.985	100	1.406	100	1.296	99.9971
135	1.337	100	1.384	100	1.396	100	1.917	100	2.201	100	1.642	100
138	2.383	100	1.861	100	2.440	100	1.896	100	1.359	100	1.803	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	1.761	100	1.989	100	2.124	100	1.810	100	1.713	100	1.765	100
2	1.645	100	1.570	100	1.575	100	1.733	100	1.907	100	2.030	100
3	0.801	100	0.833	100	0.668	100	0.590	100	0.631	100	0.645	100
4	1.244	100	1.105	100	1.380	100	1.052	100	1.498	100	1.920	100
5	1.150	100	1.089	100	1.078	100	0.747	100	1.003	100	1.112	100
6	0.662	100	0.706	100	0.649	100	0.557	100	0.679	100	0.605	100
7	0.866	100	0.787	100	1.011	100	0.764	100	0.800	100	0.837	100
8	0.544	100	0.611	100	0.737	100	0.690	100	0.538	100	0.719	100
9	1.079	100	0.940	100	0.905	100	0.930	100	0.569	100	1.011	100
10	0.356	100	0.395	100	0.523	100	0.408	100	1.052	100	0.506	100
11	0.543	100	0.422	100	0.461	100	0.483	100	1.034	100	0.448	100
12	0.745	100	0.769	100	0.755	100	0.546	100	0.645	100	0.638	100
13	0.769	100	0.976	100	0.764	100	0.689	100	0.919	100	0.624	100
14	1.062	100	0.529	100	0.587	100	0.488	100	0.718	100	0.505	100
15	0.797	100	0.891	100	0.895	100	0.868	100	1.228	100	0.791	100
16	0.604	100	0.621	100	0.661	100	0.673	100	0.865	100	0.937	100
17	1.171	100	0.846	100	0.999	100	0.579	100	1.173	100	0.633	100
18	0.791	100	0.561	100	0.849	100	0.884	100	1.140	100	0.765	100
19	1.428	100	1.380	100	1.436	100	1.569	100	2.407	100	1.550	100
20	0.500	100	0.667	100	0.640	100	0.748	100	0.898	100	0.640	100
21	0.844	100	0.745	100	1.081	100	0.966	100	0.985	100	0.908	100
22	1.573	100	1.523	100	1.719	100	1.788	100	1.941	100	1.629	100
23	1.133	100	1.220	100	1.478	100	1.437	100	2.041	100	1.090	100
24	1.861	100	1.968	100	1.869	100	1.584	100	1.784	100	1.643	100
25	1.530	100	1.936	100	1.455	100	1.367	100	1.519	100	1.484	100
26	0.958	100	0.881	100	0.860	100	0.664	100	0.842	100	0.802	100
27	1.400	100	1.427	100	1.489	100	1.315	100	1.364	100	1.458	100
28	1.302	100	0.525	100	0.686	100	0.632	100	0.762	100	0.663	100
29	0.998	100	1.067	100	0.828	100	0.859	100	0.772	100	0.901	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	1.423	100	0.887	100	0.532	100	0.611	100	0.872	100	0.977	100
32	0.536	100	0.740	100	0.519	100	0.472	100	0.706	100	0.478	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	1.672	100	1.970	100	1.813	100	1.990	100	1.679	100	1.918	100
2	1.536	100	1.525	100	1.628	100	1.619	100	1.898	100	1.615	100
3	0.772	100	0.827	100	0.716	100	0.719	100	0.513	100	0.845	100
4	0.953	100	1.200	100	0.898	100	1.045	100	0.740	100	1.064	100
5	1.059	100	1.092	100	1.047	100	0.958	100	0.677	100	1.175	100
6	0.653	100	0.794	100	0.537	100	0.593	100	0.423	100	0.730	100
7	0.865	100	0.896	100	1.121	100	0.812	100	0.576	100	1.124	100
8	0.629	100	0.669	100	0.787	100	0.778	100	0.475	100	0.809	100
9	0.806	100	1.106	100	0.870	100	0.848	100	0.531	100	1.014	100
10	0.348	100	0.454	100	0.406	100	0.398	100	0.723	100	0.507	100
11	0.515	100	0.421	100	1.028	100	0.625	100	0.866	100	0.589	100
12	0.678	100	0.763	100	0.784	100	0.710	100	0.605	100	1.013	100
13	0.630	100	0.869	100	0.765	100	0.711	100	0.485	100	0.823	100
14	0.446	100	0.496	100	0.552	100	0.471	100	0.622	100	0.552	100
15	0.825	100	0.867	100	0.874	100	0.940	100	0.669	100	1.115	100
16	0.595	100	0.511	100	0.748	100	0.634	100	0.859	100	0.618	100
17	0.839	100	0.796	100	0.816	100	0.765	100	0.338	100	0.863	100
18	0.708	100	0.701	100	0.728	100	0.732	100	1.266	100	0.846	100
19	1.314	100	1.408	100	1.468	100	1.396	100	1.871	100	1.488	100
20	0.428	100	0.586	100	1.044	100	0.726	100	1.020	100	0.567	100
21	0.474	100	0.547	100	1.253	100	0.711	100	1.190	100	0.887	100
22	1.527	100	1.563	100	1.821	100	1.776	100	2.168	100	1.618	100
23	1.114	100	1.135	100	1.661	100	1.143	100	1.673	100	1.085	100
24	1.908	100	2.213	100	1.787	100	1.822	100	1.557	100	2.207	100
25	1.669	100	1.521	100	1.653	100	1.482	100	1.069	100	1.955	100
26	0.849	100	0.861	100	0.736	100	0.934	100	0.487	100	0.991	100
27	1.496	100	1.443	100	1.377	100	1.585	100	1.329	100	1.560	100
28	0.380	100	0.498	100	1.415	100	0.489	100	0.959	100	0.598	100
29	0.885	100	1.183	100	1.001	100	1.006	100	0.619	100	1.152	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	0.717	100	0.812	100	0.900	100	0.575	100	0.438	100	0.847	100
32	0.468	100	0.936	100	0.684	100	0.504	100	0.653	100	0.675	100

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

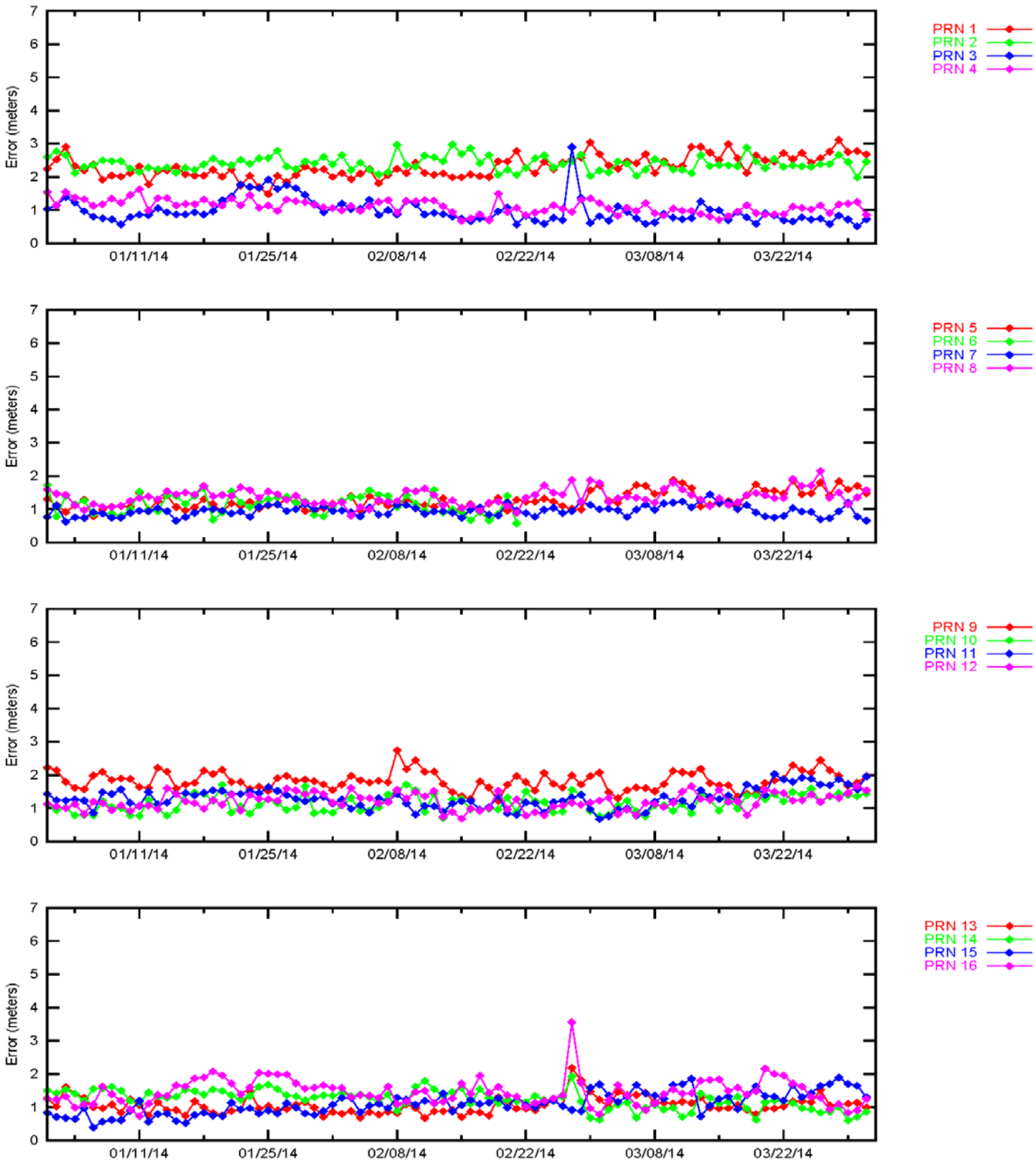


Figure 6-2 95% Range Error (PRN 17 – PRN 32) – Washington DC

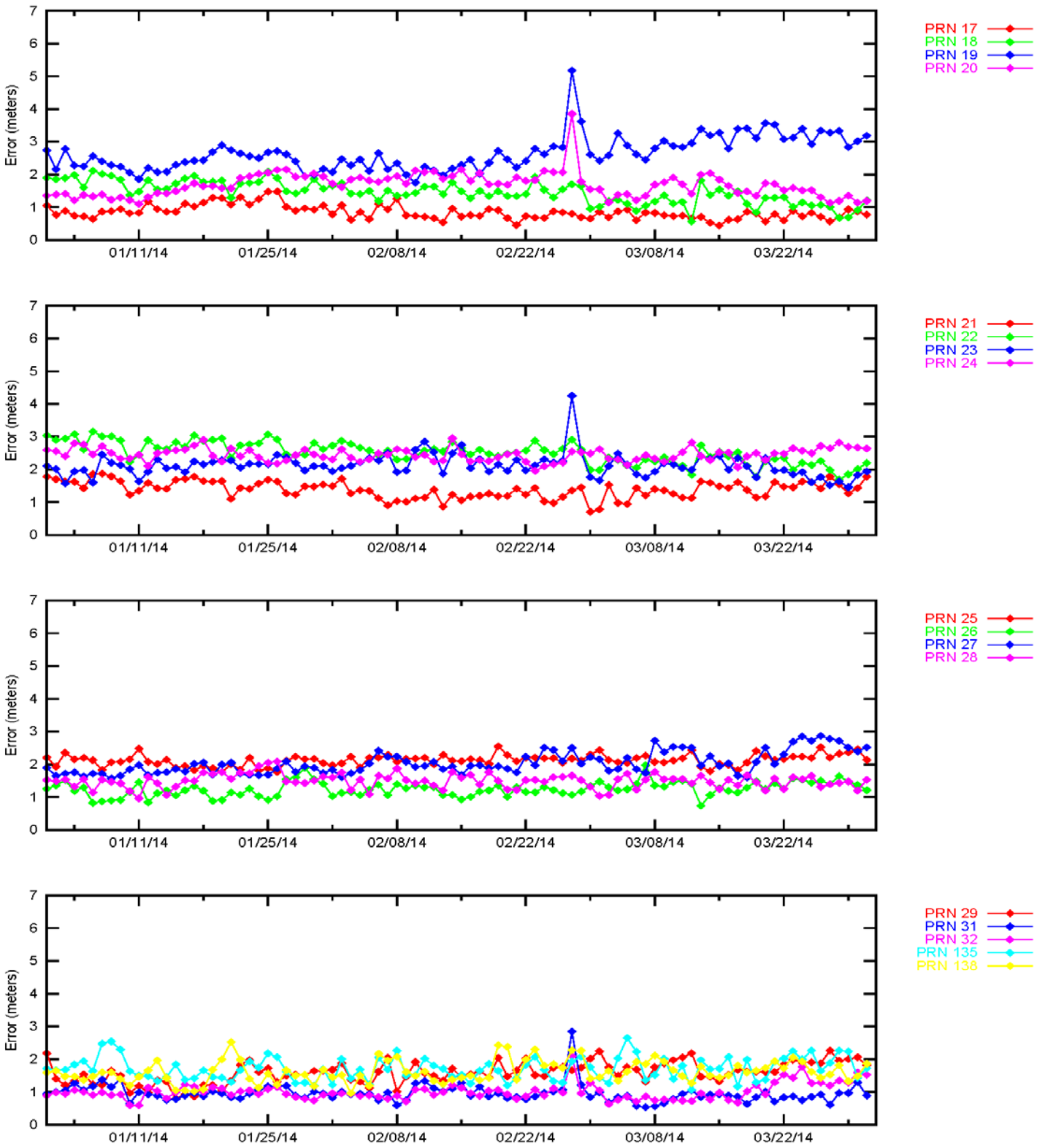


Figure 6-3 95% Ionospheric Error (PRN 1 – PRN 16) – Washington DC

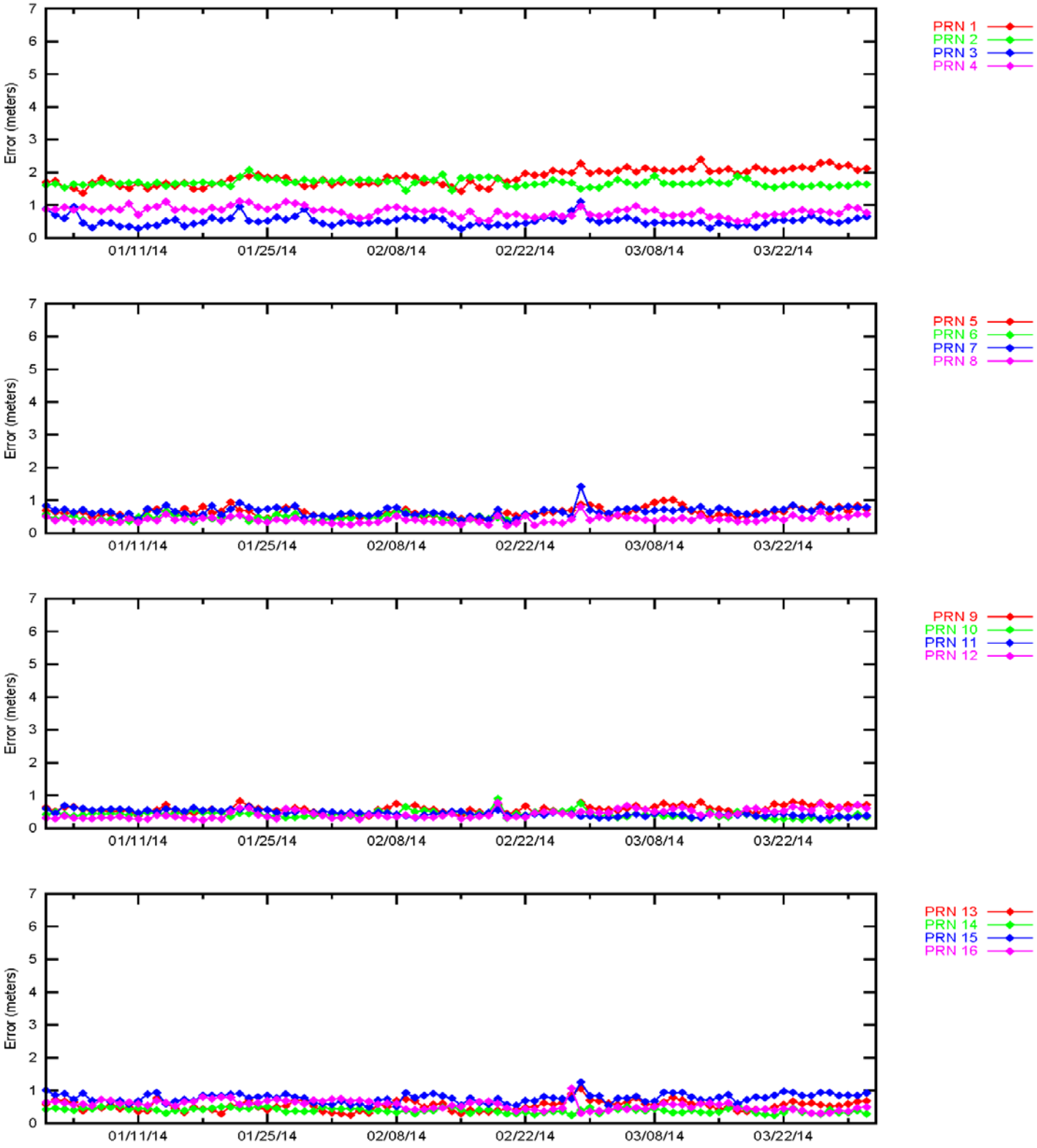
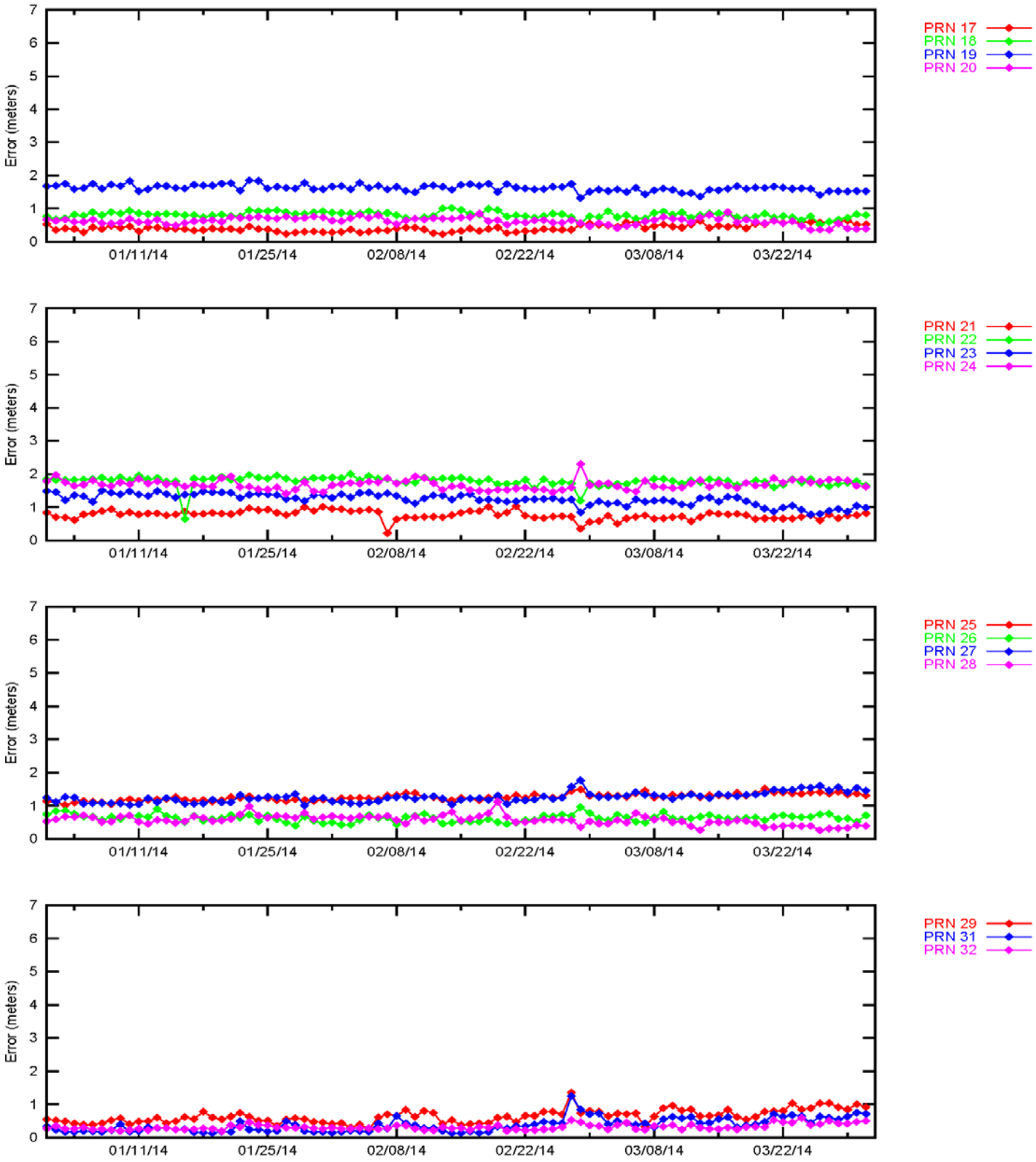


Figure 6-4 95% Ionospheric Error (PRN 17 - PRN 32) – Washington DC



7.0 GEO RANGING PERFORMANCE

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

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

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
AMR 133	CRW	99.95	0.00	0.01	0.00
AMR 133	CRE	98.73	0.60	0.11	0.53
AMR 133	AMR	0	99.37	0.35	0.24
CRW 135	CRW	99.96	0.00	0.01	0.00
CRW 135	CRE	98.74	0.60	0.11	0.53
CRW 135	AMR	0.00	99.38	0.35	0.24
CRE 138	CRW	99.96	0.00	0.01	0.00
CRE 138	CRE	98.73	0.60	0.11	0.53
CRE 138	AMR	0.00	99.38	0.35	0.24

Figure 7-1 Daily PA CRW GEO Ranging Availability Trend

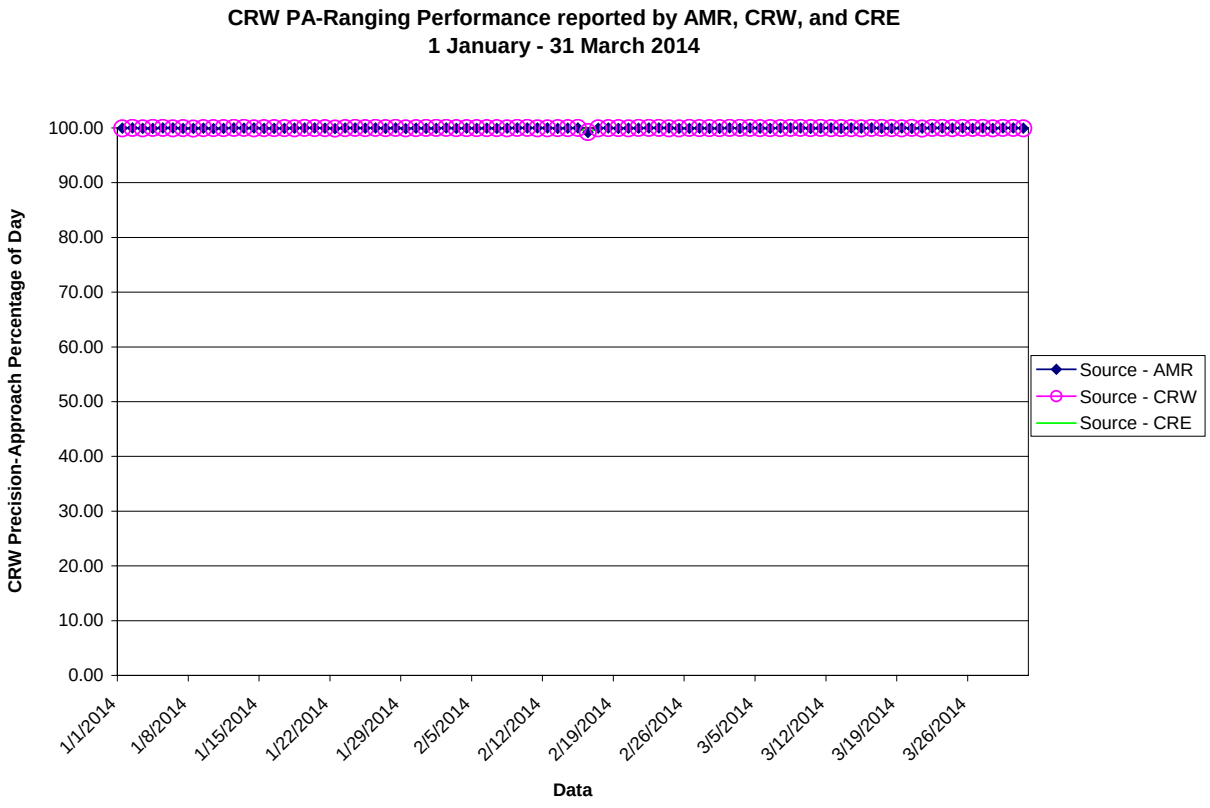


Figure 7-2 Daily PA CRE GEO Ranging Availability Trend

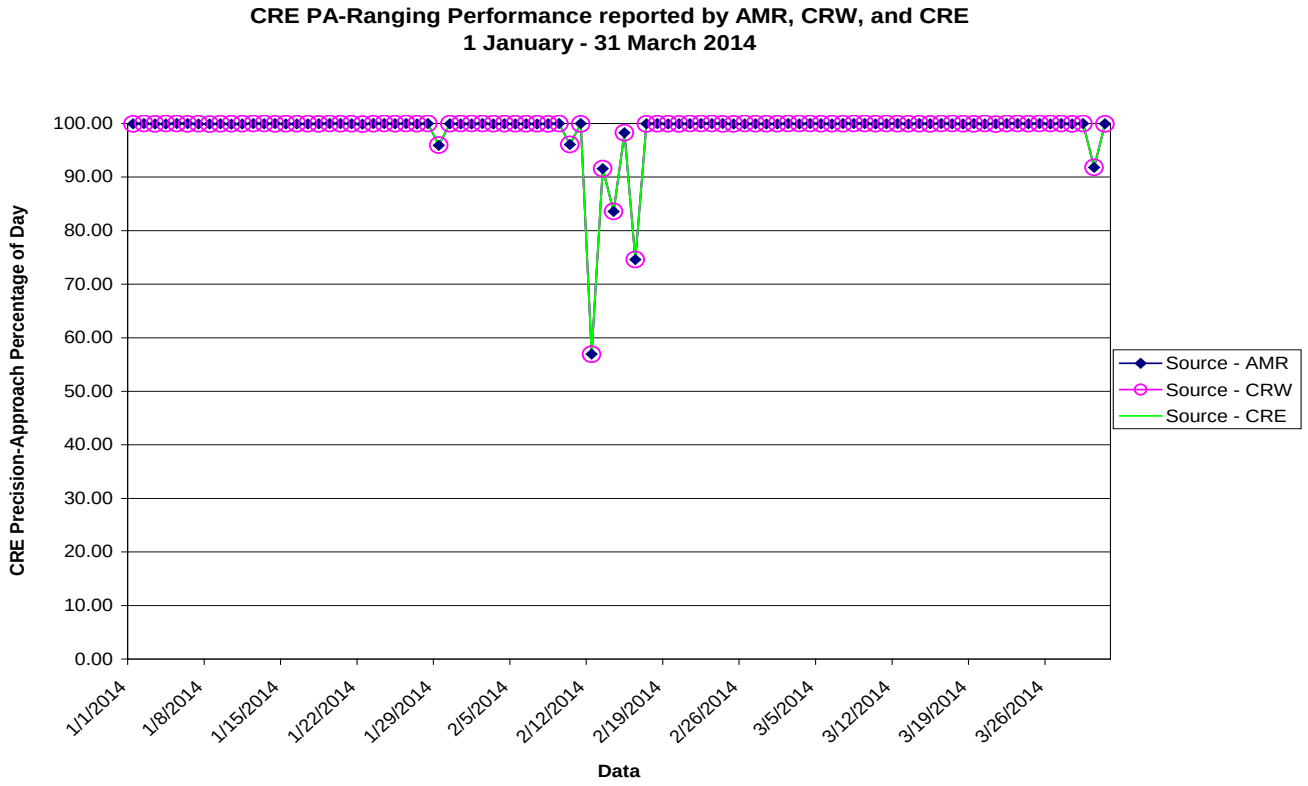
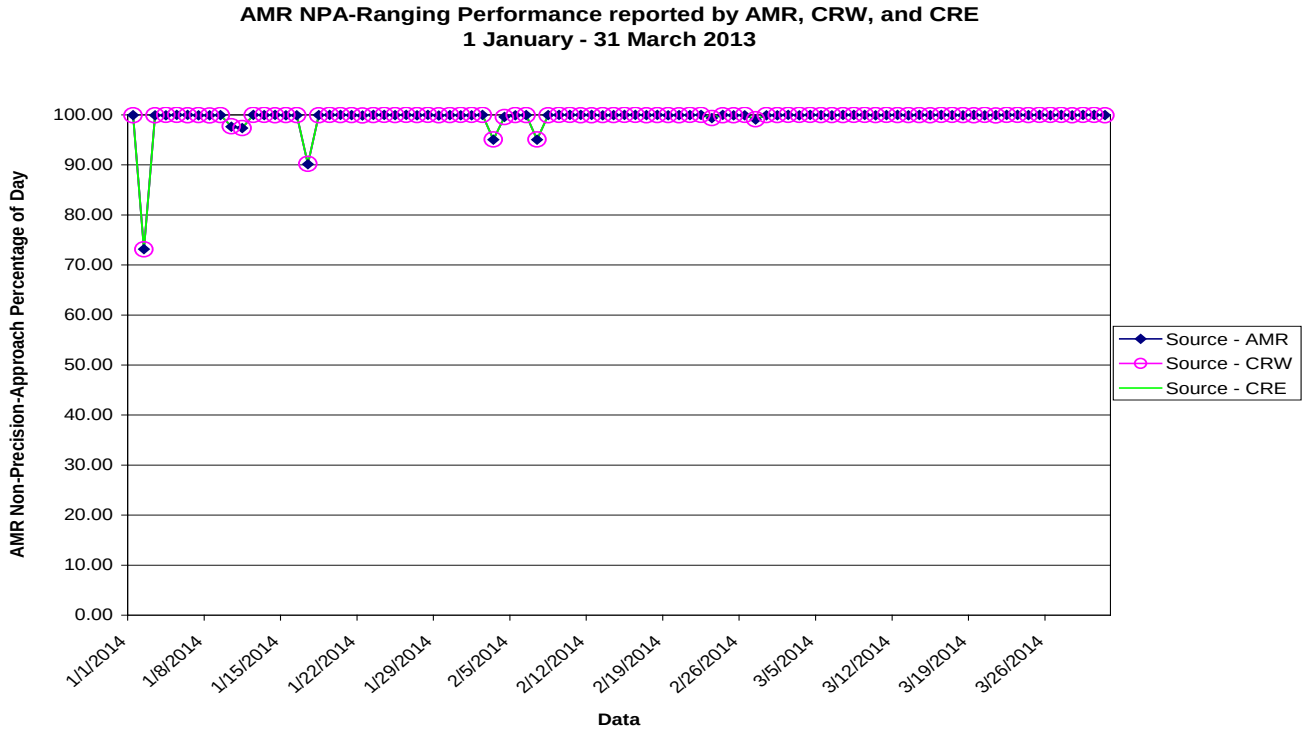


Figure 7-3 Daily NPA AMR GEO Ranging Availability Trend



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/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CAL4	FORT MACKAY / ALBIAN AERODROME	AB	LPV	4	0.997172	5	0.996948	11	0.995563
CEV3	VEGREVILLE	AB	LPV	1	0.997488	1	0.997438	7	0.996894
CYEG	EDMONTON / JOSEPHBURG	AB	LPV	1	0.997535	1	0.997504	7	0.996836
CYXD	EDMONTON CITY CTR	AB	LPV	1	0.997535	1	0.997469	7	0.996806
2C7	SHAKTOOLIK	AK	LPV	5	0.997288	5	0.996636	14	0.995459
6A8	ALLAKAKET	AK	LP	5	0.995849	6	0.995413	11	0.993715
7KA	TATITLEK	AK	LP	2	0.997735	3	0.997492	9	0.996586
9A3	CHUATHBALUK	AK	LPV	3	0.998110	5	0.997921	8	0.996424
AKN	KING SALMON	AK	LPV	3	0.998299	3	0.998256	9	0.997072
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	2	0.997708	2	0.997577	7	0.996628
AQH	QUINHAGAK	AK	LPV	6	0.999672	7	0.998823	24	0.996188
AQT	NUIQSUT	AK	LPV	7	0.994815	9	0.994379	64	0.988870
BET	BETHEL	AK	LPV200	6	0.998962	5	0.998148	15	0.996127
BRW	WILEY POST-WILL ROGERS MEM	AK	LPV	9	0.994020	25	0.992519	242	0.966971
CDB	COLD BAY	AK	LPV200	1	0.999738	6	0.999117	422	0.947137
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	2	0.997689	3	0.997431	6	0.996690
CLP	CLARKS POINT	AK	LPV	5	0.998542	3	0.998248	14	0.996944
CXF	COLDFOOT	AK	LP	5	0.995513	6	0.994877	18	0.993345

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	7	0.995104	10	0.994672	60	0.989302
DLG	DILLINGHAM	AK	LPV	3	0.998252	4	0.998237	13	0.996979
ELI	ELIM	AK	LPV	5	0.997079	5	0.996551	16	0.995305
ENA	KENAI MUNICIPAL	AK	LPV200	2	0.997820	2	0.997677	8	0.996640
ENM	EMMONAK	AK	LPV	6	0.997554	6	0.997203	21	0.995243
FAI	FAIRBANKS INTL	AK	LPV200	4	0.995972	4	0.995748	10	0.994772
GAL	EDWARD G. PITKA	AK	LPV	5	0.997284	7	0.996578	9	0.994630
GKN	GULKANA	AK	LPV	5	0.997369	5	0.996489	4	0.995409
HLA	HUSLIA	AK	LPV	6	0.996080	7	0.995598	11	0.994020
HOM	HOMER	AK	LPV	1	0.997967	3	0.997728	8	0.996701
HPB	HOOPER BAY	AK	LP	7	0.998380	7	0.997623	39	0.993252
ILI	ILIAMNA	AK	LPV	2	0.998110	3	0.997867	8	0.996948
KAL	KALTAG	AK	LPV	5	0.997627	5	0.996686	12	0.995459
KSM	ST MARY'S	AK	LPV200	5	0.998075	6	0.997550	13	0.995594
KTN	KETCHIKAN INTL	AK	LPV	1	0.997531	1	0.997469	6	0.996790
KWT	KWETHLUK	AK	LPV	5	0.998816	5	0.998117	12	0.996312
KYU	KOYUKUK	AK	LPV	5	0.997319	7	0.996462	12	0.994587
MCG	MCGRATH	AK	LP	2	0.997805	4	0.997581	10	0.995436
MDM	MARSHALL DON HUNTER SR	AK	LP	4	0.997882	5	0.997623	10	0.995949
MDO	MIDDLETON ISLAND	AK	LP	2	0.997832	2	0.997585	5	0.996983
OOK	TOKSOOK BAY	AK	LP	6	0.999101	8	0.998754	42	0.993553
ORT	NORTHWAY	AK	LP	4	0.996412	3	0.996084	5	0.995282
OTZ	RALPH WIEN MEMORIAL	AK	LPV200	6	0.994900	10	0.994471	78	0.986925
PAQ	PALMER MUNICIPAL	AK	LP	2	0.997716	3	0.997562	8	0.996539
RBY	RUBY	AK	LPV	8	0.997106	8	0.996292	9	0.994707
SCC	DEADHORSE	AK	LPV	6	0.994973	9	0.994286	66	0.988858
SCM	SCAMMON BAY	AK	LP	7	0.998383	7	0.997566	31	0.994363
SHG	SHUNGNAK	AK	LP	6	0.995397	6	0.994977	13	0.993059
SHX	SHAGELUK	AK	LPV	3	0.997859	4	0.997496	9	0.996065
SMK	ST MICHAEL	AK	LPV	6	0.997531	5	0.997087	14	0.995586
UNK	UNALAKLEET	AK	LP	5	0.997338	5	0.996728	13	0.995706
WLK	SELAWIK	AK	LPV	6	0.995274	6	0.994977	16	0.992886
WNA	NAPAKIAK	AK	LPV	7	0.999387	6	0.998542	17	0.996092
YAK	YAKUTAT	AK	LPV200	4	0.997407	4	0.996817	7	0.996111
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	1	0	1	0	1
0J6	HEADLAND MUNICIPAL	AL	LPV	0	1	0	1	0	1
0R1	ATMORE MUNICIPAL	AL	LP	0	1	0	1	1	0.999985
12J	BREWTON MUNICIPAL	AL	LPV	0	1	0	1	1	0.999992
1M4	POSEY FIELD	AL	LPV	0	1	0	1	1	0.999853
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	1	0	1	1	0.999981
2R5	ST ELMO	AL	LPV	0	1	0	1	1	0.999969
3A1	FOLSOM FIELD	AL	LPV	0	1	0	1	2	0.999784
3M8	NORTH PICKENS	AL	LP	0	1	0	1	0	1
4A9	ISBELL FIELD	AL	LPV	0	1	0	1	2	0.999684
5R4	FOLEY MUNICIPAL	AL	LPV	0	1	0	1	1	0.999973
79J	SOUTH ALABAMA RGNL AT BILL BENTON FIELD	AL	LPV	0	1	0	1	1	0.999996
8A0	ALBERTVILLE MUNICIPAL-T. J. BRUMLIK FIELD	AL	LPV	0	1	0	1	2	0.999730
9A4	LAWRENCE COUNTY	AL	LPV200	0	1	0	1	2	0.999803
ANB	ANNISTON METROPOLITAN	AL	LPV	0	1	0	1	1	0.999954
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	1	0	1	1	0.999965
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	1	0	1	0	1
BFM	MOBILE DOWNTOWN	AL	LPV200	0	1	0	1	1	0.999973

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BHM	BIRMINGHAM INTL	AL	LPV200	0	1	0	1	1	0.999992
CQF	H L SONNY CALLAHAN	AL	LPV200	0	1	0	1	1	0.999969
DCU	PRYOR FIELD RGNL	AL	LPV200	0	1	0	1	2	0.999769
DHN	DOTHAN RGNL	AL	LPV200	0	1	0	1	0	1
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	1	0	1	1	0.999996
EET	SHELBY COUNTY	AL	LPV	0	1	0	1	0	1
EKY	BESSEMER	AL	LPV	0	1	0	1	0	1
EUF	WEEDON FIELD	AL	LPV	0	1	0	1	0	1
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	1	0	1	2	0.999753
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	1	0	1	1	0.999892
HSV	HUNTSVILLE INTL-CARL T JONES FLD	AL	LPV200	0	1	0	1	2	0.999753
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	1	0	1	2	0.999865
JKA	JACK EDWARDS	AL	LPV200	0	1	0	1	1	0.999969
M95	RICHARD ARTHUR FIELD	AL	LPV	0	1	0	1	0	1
MDQ	MADISON COUNTY EXECUTIVE/TOM SHARP JR FLD	AL	LPV	0	1	1	0.999981	2	0.999718
MGM	MONTGOMERY RGNL (DANNELLY FIELD)	AL	LPV200	0	1	0	1	0	1
MOB	MOBILE RGNL	AL	LPV200	0	1	0	1	1	0.999977
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	1	0	1	2	0.999838
PLR	ST CLAIR COUNTY	AL	LPV	0	1	0	1	1	0.999977
PYP	CENTRE-PIEDMONT CHEROKEE COUNTY RGNL	AL	LPV	0	1	0	1	2	0.999699
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	1	0	1	0	1
SEM	CRAIG FIELD	AL	LPV	0	1	0	1	0	1
TCL	TUSCALOOSA RGNL	AL	LPV	0	1	0	1	0	1
TOI	TROY MUNICIPAL	AL	LPV	0	1	0	1	0	1
4M3	CARLISLE MUNICIPAL	AR	LPV	0	1	0	1	1	0.999985
7M1	MC GEHEE MUNICIPAL	AR	LP	0	1	0	1	1	0.999992
ARG	WALNUT RIDGE RGNL	AR	LPV200	0	1	0	1	5	0.999641
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	1	0	1	1	0.999996
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV200	0	1	0	1	1	0.999973
BPK	OZARK RGNL	AR	LPV	0	1	0	1	2	0.999780
BVX	BATESVILLE RGNL	AR	LPV	0	1	0	1	1	0.999996
BYH	ARKANSAS INTL	AR	LPV200	0	1	1	0.999985	5	0.999742
CDH	HARRELL FIELD	AR	LPV	0	1	0	1	1	0.999996
ELD	SOUTH ARKANSAS RGNL AT GOODWIN FIELD	AR	LPV	0	1	0	1	1	0.999996
FSM	FORT SMITH RGNL	AR	LPV200	0	1	0	1	1	0.999996
FYV	DRAKE FIELD	AR	LPV	0	1	0	1	1	0.999996
HRO	BOONE COUNTY	AR	LPV	0	1	0	1	1	0.999996
JBR	JONESBORO MUNICIPAL	AR	LPV	0	1	0	1	2	0.999946
LIT	ADAMS FIELD	AR	LPV200	0	1	0	1	1	0.999996
M19	NEWPORT MUNICIPAL	AR	LPV	0	1	0	1	1	0.999992
M77	HOWARD COUNTY	AR	LP	0	1	0	1	0	1
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	1	0	1	1	0.999996
PBF	GRIDER FIELD	AR	LPV	0	1	0	1	1	0.999988
ROG	ROGERS MUNICIPAL-CARTER FIELD	AR	LPV	0	1	0	1	1	0.999996
RUE	RUSSELLVILLE RGNL	AR	LPV	0	1	0	1	0	1
SGT	STUTTGART MUNICIPAL	AR	LPV	0	1	0	1	1	0.999981
SLG	SMITH FIELD	AR	LPV	0	1	0	1	1	0.999988

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
SRC	SEARCY MUNICIPAL	AR	LPV	0	1	0	1	1	0.999992
SUZ	SALINE COUNTY RGNL	AR	LPV	0	1	0	1	1	0.999996
TXK	TEXARKANA RGNL-WEBB FIELD	AR	LPV	0	1	0	1	0	1
VBT	BENTONVILLE MUNICIPAL/LOUISE M THADEN FIELD	AR	LPV	0	1	0	1	1	0.999992
XNA	NORTHWEST ARKANSAS RGNL	AR	LPV200	0	1	0	1	1	0.999992
AVQ	MARANA RGNL	AZ	LP	0	1	0	1	6	0.999819
D68	SPRINGERVILLE MUNICIPAL	AZ	LP	0	1	0	1	1	0.999977
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	1	0	1	3	0.999819
FFZ	FALCON FLD	AZ	LP	0	1	0	1	3	0.999830
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	1	0	1	4	0.999861
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	1	0	1	2	0.999884
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	1	0	1	5	0.999796
HII	LAKE HAVASU CITY	AZ	LPV	0	1	0	1	2	0.999765
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	1	0	1	2	0.999761
IGM	KINGMAN	AZ	LPV	0	1	0	1	2	0.999776
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	1	0	1	3	0.999834
P33	COCHISE COUNTY	AZ	LPV	0	1	0	1	2	0.999900
PGA	PAGE MUNICIPAL	AZ	LPV	0	1	0	1	1	0.999992
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	1	0	1	5	0.999807
PRC	ERNEST A. LOVE FIELD	AZ	LPV	0	1	0	1	2	0.999823
RQE	WINDOW ROCK	AZ	LP	0	1	0	1	1	0.999996
SAD	SAFFORD RGNL	AZ	LPV	0	1	0	1	2	0.999919
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	1	0	1	1	0.999985
SOW	SHOW LOW RGNL	AZ	LPV	0	1	0	1	2	0.999934
TUS	TUCSON INTL	AZ	LPV	0	1	0	1	4	0.999830
CYBL	CAMPBELL RIVER	BC	LPV	1	0.997693	1	0.997654	5	0.997292
CYCD	NANAIMO	BC	LPV	1	0.997793	1	0.997716	6	0.997292
CYVR	VANCOUVER INTL	BC	LPV	1	0.997851	1	0.997770	6	0.997330
CYXS	PRINCE GEORGE	BC	LPV	1	0.997650	1	0.997523	7	0.996971
CYYJ	VICTORIA INTL	BC	LPV	1	0.997851	1	0.997766	6	0.997377
CZBB	VANCOUVER / BOUNDARY BAY	BC	LPV	1	0.997851	1	0.997774	6	0.997384
AAT	ALTURAS MUNICIPAL	CA	LPV	0	1	0	1	7	0.999356
ACV	ARCATA	CA	LPV200	1	0.999977	2	0.999942	98	0.989144
APC	NAPA COUNTY	CA	LPV	0	1	2	0.999842	99	0.993110
APV	APPLE VALLEY	CA	LPV	0	1	0	1	5	0.999637
AUN	AUBURN MUNICIPAL	CA	LPV	0	1	1	0.999907	90	0.996879
BFL	MEADOWS FIELD	CA	LPV200	0	1	1	0.999988	19	0.999348
BLH	BLYTHE	CA	LP	0	1	0	1	4	0.999753
C83	BYRON	CA	LPV	0	1	2	0.999877	96	0.994456
CCR	BUCHANAN FIELD	CA	LPV	0	1	2	0.999853	100	0.993468
CEC	JACK MC NAMARA FIELD	CA	LPV200	1	0.999969	2	0.999965	99	0.990559
CIC	CHICO MUNICIPAL	CA	LPV	0	1	1	0.999892	96	0.995274
CMA	CAMARILLO	CA	LPV	0	1	2	0.999934	77	0.997867
CNO	CHINO	CA	LPV	0	1	0	1	5	0.999564
CRQ	MC CLELLAN-PALOMAR	CA	LPV200	0	1	0	1	5	0.999541
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	1	2	0.999884	102	0.993032
DAG	BARSTOW-DAGGETT	CA	LPV	0	1	0	1	4	0.999668
DWA	YOLO COUNTY-DAVIS/WOODLAND/WINTERS	CA	LPV	0	1	2	0.999869	98	0.994788

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
FAT	FRESNO YOSEMITE INTL	CA	LPV	0	1	1	0.999946	36	0.998873
HAF	HALF MOON BAY	CA	LPV	0	1	2	0.999784	105	0.990417
HHR	HAWTHORNE JACK NORTHROP FIELD	CA	LPV	0	1	0	1	9	0.999506
HWD	HAYWARD EXECUTIVE	CA	LPV	0	1	2	0.999850	100	0.992303
LAX	LOS ANGELES INTL	CA	LPV	0	1	0	1	15	0.999479
LGB	LONG BEACH/DAUGHERTY FIELD	CA	LPV	0	1	0	1	6	0.999529
LHM	LINCOLN RGNL/KARL HARDER FIELD	CA	LPV200	0	1	2	0.999900	95	0.996242
LLR	LITTLE RIVER	CA	LP	2	0.999992	4	0.999776	100	0.988843
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	1	2	0.999911	87	0.996065
LVK	LIVERMORE MUNICIPAL	CA	LPV	0	1	2	0.999865	101	0.993673
MAE	MADERA MUNICIPAL	CA	LPV	0	1	1	0.999938	51	0.998256
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	1	1	0.999927	70	0.997485
MER	CASTLE	CA	LPV200	0	1	1	0.999927	71	0.997512
MHR	SACRAMENTO MATHER	CA	LPV200	0	1	2	0.999900	95	0.996238
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	1	1	0.999988	27	0.999171
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	1	2	0.999915	90	0.996647
MRY	MONTEREY PENINSULA	CA	LPV	0	1	2	0.999815	110	0.989545
MYF	MONTGOMERY FIELD	CA	LPV200	0	1	0	1	5	0.999541
MYV	YUBA COUNTY	CA	LPV200	0	1	2	0.999892	96	0.995675
O02	NERVINO	CA	LPV	0	1	0	1	60	0.998738
O27	OAKDALE	CA	LPV	0	1	2	0.999915	84	0.997133
O69	PETALUMA MUNICIPAL	CA	LPV	0	1	2	0.999830	101	0.992195
O88	RIO VISTA MUNICIPAL	CA	LP	0	1	2	0.999877	98	0.994969
OAK	METROPOLITAN OAKLAND INTL	CA	LPV	0	1	2	0.999846	100	0.992025
ONT	ONTARIO INTL	CA	LPV	0	1	0	1	5	0.999564
OVE	OROVILLE MUNICIPAL	CA	LPV	0	1	1	0.999896	96	0.995837
OXR	OXNARD	CA	LPV	0	1	2	0.999927	82	0.997238
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	1	0	1	6	0.999583
POC	BRACKETT FIELD	CA	LPV	0	1	0	1	6	0.999560
PRB	PASO ROBLES MUNICIPALCIPAL	CA	LPV200	0	1	2	0.999919	94	0.992770
PVF	PLACERVILLE	CA	LPV	0	1	1	0.999915	78	0.997573
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	1	0	1	5	0.999568
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	1	1	0.999900	97	0.994387
RDD	REDDING MUNICIPAL	CA	LPV	0	1	1	0.999988	97	0.994518
RHV	REID-HILLVIEW OF SANTA CLARA	CA	LPV	0	1	2	0.999865	103	0.992878
SAC	SACRAMENTO EXECUTIVE	CA	LPV200	0	1	2	0.999888	95	0.995760
SAN	SAN DIEGO INTL	CA	LP	0	1	0	1	6	0.999529
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	1	2	0.999865	96	0.993704
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	1	2	0.999880	101	0.990849
SCK	STOCKTON METROPOLITAN	CA	LPV	0	1	2	0.999900	95	0.996115
SEE	GILLESPIE FIELD	CA	LP	0	1	0	1	4	0.999552
SFO	SAN FRANCISCO INTL	CA	LPV	0	1	2	0.999788	103	0.991412
SJC	NORMAN Y. MINETA SAN JOSE INTL	CA	LPV	0	1	2	0.999861	103	0.992234
SMF	SACRAMENTO INTL	CA	LPV200	0	1	2	0.999884	96	0.995544
SMX	SANTA MARIA PUBLIC/CAPT G ALLAN HANCOCK FIELD	CA	LPV200	0	1	2	0.999853	101	0.990976
SNA	JOHN WAYNE-ORANGE	CA	LPV	0	1	0	1	5	0.999537

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
	COUNTY								
SNS	SALINAS MUNICIPAL	CA	LPV200	0	1	2	0.999830	106	0.990691
STS	CHARLES M. SCHULZ-SONOMA COUNTY	CA	LPV	0	1	2	0.999819	100	0.991640
TCY	TRACY MUNICIPAL	CA	LPV	0	1	2	0.999884	96	0.995066
TOA	ZAMPERINI FIELD	CA	LPV200	0	1	0	1	9	0.999502
VCB	NUT TREE	CA	LPV	0	1	2	0.999869	98	0.994182
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	1	0	1	5	0.999626
VIS	VISALIA MUNICIPAL	CA	LPV200	0	1	1	0.999958	30	0.999028
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	1	0	1	6	0.999587
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	1	2	0.999873	97	0.994151
ALS	SAN LUIS VALLEY RGNL/BERGMAN FIELD	CO	LPV200	0	1	0	1	1	0.999985
APA	CENTENNIAL	CO	LPV200	0	1	0	1	1	0.999780
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	1	0	1	1	0.999769
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	1	0	1	0	1
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	1	0	1	1	0.999811
DEN	DENVER INTL	CO	LPV200	0	1	0	1	1	0.999769
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	1	0	1	0	1
FMM	FORT MORGAN MUNICIPAL	CO	LP	0	1	0	1	2	0.999545
FNL	FORT COLLINS-LOVELAND MUNICIPAL	CO	LPV200	0	1	0	1	2	0.999560
FTG	FRONT RANGE	CO	LPV200	0	1	0	1	1	0.999772
GJT	GRAND JUNCTION RGNL	CO	LPV200	0	1	0	1	1	0.999996
GXY	GREELEY-WELD COUNTY	CO	LPV	0	1	0	1	2	0.999549
HDN	YAMPA VALLEY	CO	LPV	0	1	0	1	2	0.999803
ITR	KIT CARSON COUNTY	CO	LPV	0	1	0	1	1	0.999792
LAA	LAMAR MUNICIPAL	CO	LPV	0	1	0	1	1	0.999838
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	1	0	1	1	0.999865
MTJ	MONTROSE RGNL	CO	LPV	0	1	0	1	0	1
PUB	PUEBLO MEMORIAL	CO	LPV200	0	1	0	1	1	0.999884
RIL	GARFIELD COUNTY RGNL	CO	LPV	0	1	0	1	1	0.999954
STK	STERLING MUNICIPAL	CO	LPV	0	1	1	0.999938	2	0.999352
TEX	TELLURIDE RGNL	CO	LP	0	1	0	1	0	1
BDL	BRADLEY INTL	CT	LPV200	2	0.998260	3	0.998187	5	0.997203
GON	GROTON-NEW LONDON	CT	LPV	1	0.998256	2	0.998218	6	0.997350
HVN	TWEED-NEW HAVEN	CT	LPV	1	0.998256	2	0.998218	5	0.997608
IJD	WINDHAM	CT	LP	1	0.998287	3	0.998179	5	0.997215
OXC	WATERBURY-OXFORD	CT	LPV	1	0.998256	2	0.998218	5	0.997596
DCA	RONALD REAGAN WASHINGTON NATL	DC	LPV	1	0.998368	1	0.998299	2	0.998179
HEF	MANASSAS RGNL/HARRY P. DAVIS FIELD	DC	LPV	1	0.998368	1	0.998333	2	0.998202
IAD	WASHINGTON DULLES INTL	DC	LPV200	1	0.998368	1	0.998260	2	0.998202
33N	DELAWARE AIRPARK	DE	LP	1	0.998368	1	0.998256	1	0.998221
EVY	SUMMIT	DE	LPV	1	0.998368	1	0.998256	1	0.998187
GED	SUSSEX COUNTY	DE	LPV	1	0.998368	1	0.998299	1	0.998221
ILG	NEW CASTLE	DE	LPV	1	0.998299	1	0.998256	1	0.998187
1J0	TRI-COUNTY	FL	LP	0	1	0	1	1	0.999996
28J	PALATKA MUNICIPALCIPAL ARPT	FL	LPV	0	1	0	1	1	0.999996
40J	PERRY-FOLEY	FL	LPV	0	1	0	1	1	0.999992
54J	DEFUNIAK SPRINGS	FL	LP	0	1	0	1	1	0.999985

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
AAF	APALACHICOLA MUNICIPAL	FL	LPV	0	1	0	1	1	0.999981
APF	NAPLES MUNICIPAL	FL	LPV	0	1	0	1	2	0.999915
AVO	AVON PARK EXECUTIVE	FL	LPV	0	1	0	1	2	0.999954
BCT	BOCA RATON	FL	LPV	0	1	0	1	4	0.999907
BKV	HERNANDO COUNTY	FL	LPV	0	1	0	1	1	0.999969
BOW	BARTOW MUNICIPAL	FL	LPV	0	1	0	1	1	0.999965
CEW	BOB SIKES	FL	LPV	0	1	0	1	1	0.999985
CHN	WAUCHULA MUNICIPAL	FL	LP	0	1	0	1	1	0.999954
COI	MERRITT ISLAND	FL	LPV	0	1	0	1	1	0.999985
CRG	CRAIG MUNICIPAL	FL	LPV200	0	1	0	1	0	1
CTY	CROSS CITY	FL	LPV	0	1	0	1	1	0.999992
DAB	DAYTONA BEACH INTL	FL	LPV200	0	1	0	1	1	0.999996
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FLD	FL	LPV	0	1	0	1	1	0.999996
DTS	DESTIN-FORT WALTON BEACH	FL	LP	0	1	0	1	1	0.999977
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	1	0	1	1	0.999981
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	1	0	1	1	0.999996
EYW	KEY WEST INTL	FL	LPV	0	1	0	1	5	0.999823
F45	NORTH PALM BEACH COUNTY GENERAL AVIATION	FL	LPV	0	1	0	1	4	0.999915
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	1	0	1	0	1
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV	0	1	0	1	5	0.999884
FMY	PAGE FIELD	FL	LPV	0	1	0	1	1	0.999927
FPR	ST LUCIE COUNTY INTL	FL	LPV	0	1	0	1	4	0.999942
FXE	FT LAUDERDALE EXECUTIVE	FL	LPV200	0	1	0	1	4	0.999892
GIF	WINTER HAVEN'S GILBERT	FL	LPV	0	1	0	1	1	0.999965
GNV	GAINESVILLE RGNL	FL	LPV	0	1	0	1	1	0.999996
HEG	HERLONG RECREATIONAL	FL	LP	0	1	0	1	0	1
IMM	IMMOKALEE RGNL	FL	LPV	0	1	0	1	4	0.999892
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	1	0	1	2	0.999973
JAX	JACKSONVILLE INTL	FL	LPV200	0	1	0	1	0	1
LAL	LAKELAND LINDER RGNL	FL	LPV200	0	1	0	1	1	0.999961
LCQ	LAKE CITY MUNICIPAL	FL	LPV	0	1	0	1	0	1
LEE	LEESBURG INTL	FL	LPV	0	1	0	1	1	0.999985
MCO	ORLANDO INTL	FL	LPV200	0	1	0	1	1	0.999981
MIA	MIAMI INTL	FL	LPV	0	1	0	1	8	0.999842
MKY	MARCO ISLAND	FL	LPV	0	1	0	1	2	0.999911
MLB	MELBOURNE INTL	FL	LPV200	0	1	0	1	2	0.999965
MTH	THE FLORIDA KEYS MARATHON	FL	LPV	0	1	0	1	6	0.999784
OBE	OKEECHOBEE COUNTY	FL	LPV	0	1	0	1	4	0.999904
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	0	1	0	1	1	0.999988
OPF	OPA LOCKA EXECUTIVE	FL	LPV200	0	1	0	1	6	0.999861
ORL	EXECUTIVE	FL	LPV200	0	1	0	1	1	0.999981
PBI	PALM BEACH INTL	FL	LPV200	0	1	0	1	4	0.999919
PCM	PLANT CITY MUNICIPAL	FL	LPV	0	1	0	1	1	0.999958
PGD	PUNTA GORDA	FL	LPV200	0	1	0	1	1	0.999942
PHK	PALM BEACH COUNTY GLADES	FL	LPV	0	1	0	1	4	0.999873
PIE	ST PETERSBURG-CLEARWATER INTL	FL	LPV200	0	1	0	1	1	0.999954
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	1	0	1	4	0.999900

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
PNS	PENSACOLA RGNL	FL	LPV200	0	1	0	1	1	0.999969
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	1	0	1	2	0.999923
SEF	SEBRING RGNL	FL	LPV	0	1	0	1	4	0.999915
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	1	0	1	1	0.999988
SGJ	ST AUGUSTINE	FL	LPV	0	1	0	1	0	1
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	1	0	1	1	0.999942
SUA	WITHAM FIELD	FL	LPV	0	1	0	1	4	0.999931
TIX	SPACE COAST RGNL	FL	LPV200	0	1	0	1	1	0.999988
TLH	TALLAHASSEE RGNL	FL	LPV200	0	1	0	1	1	0.999996
TMB	KENDALL-TAMIAMI EXECUTIVE	FL	LPV200	0	1	0	1	9	0.999807
TPA	TAMPA INTL	FL	LPV200	0	1	0	1	1	0.999958
TPF	PETER O KNIGHT	FL	LP	0	1	0	1	1	0.999958
VDF	TAMPA EXECUTIVE	FL	LPV	0	1	0	1	1	0.999961
VNC	VENICE MUNICIPAL	FL	LP	0	1	0	1	1	0.999934
VQQ	CECIL FIELD	FL	LPV	0	1	0	1	0	1
VRB	VERO BEACH MUNICIPAL	FL	LPV200	0	1	0	1	3	0.999950
X07	LAKE WALES MUNICIPAL	FL	LP	0	1	0	1	1	0.999961
X14	LA BELLE MUNICIPAL	FL	LPV	0	1	0	1	4	0.999907
X26	SEBASTIAN MUNICIPAL	FL	LP	0	1	0	1	2	0.999961
X35	MARION CO & PARK OF COMMERCE	FL	LP	0	1	0	1	1	0.999985
X51	HOMESTEAD GENERAL AVIATION	FL	LPV	0	1	0	1	9	0.999784
XFL	FLAGLER COUNTY	FL	LPV	0	1	0	1	0	1
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	1	0	1	1	0.999965
09J	JEKYLL ISLAND	GA	LPV200	0	1	0	1	0	1
15J	COOK COUNTY	GA	LPV	0	1	0	1	0	1
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	1	0	1	0	1
18A	FRANKLIN COUNTY	GA	LPV	0	1	1	0.999996	2	0.999595
19A	JACKSON COUNTY	GA	LPV	0	1	0	1	2	0.999633
2J5	MILLEN	GA	LPV	0	1	0	1	0	1
3J7	GREENE COUNTY RGNL	GA	LPV	0	1	0	1	1	0.999911
48A	COCHRAN	GA	LPV	0	1	0	1	0	1
4A4	POLK COUNTY AIRPORT CORNELIUS MOORE FIELD	GA	LPV	0	1	0	1	2	0.999691
4J1	BRANTLEY COUNTY	GA	LPV	0	1	0	1	0	1
4J6	ST MARYS	GA	LPV	0	1	0	1	0	1
52A	MADISON MUNICIPAL	GA	LP	0	1	0	1	1	0.999911
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	1	0	1	1	0.999965
70J	CAIRO-GRADY COUNTY	GA	LPV	0	1	0	1	0	1
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	1	0	1	0	1
ACJ	JIMMY CARTER RGNL	GA	LPV	0	1	0	1	0	1
AGS	AUGUSTA RGNL AT BUSH FIELD	GA	LPV200	0	1	0	1	1	0.999915
AHN	ATHENS/BEN EPPS	GA	LPV	0	1	0	1	2	0.999745
AJR	HABERSHAM COUNTY	GA	LPV	0	1	1	0.999996	2	0.999595
ATL	HARTSFIELD - JACKSON ATLANTA INTL	GA	LPV200	0	1	0	1	1	0.999923
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	1	0	1	0	1
BGE	DECATUR COUNTY INDUSTRIAL AIR PARK	GA	LPV200	0	1	0	1	0	1
BHC	BAXLEY MUNICIPAL	GA	LPV	0	1	0	1	0	1
BIJ	EARLY COUNTY	GA	LPV	0	1	0	1	0	1
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	1	0	1	1	0.999961
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	1	0	1	0	1
CNI	CHEROKEE COUNTY	GA	LPV	0	1	0	1	2	0.999641
CSG	COLUMBUS METROPOLITAN	GA	LPV	0	1	0	1	0	1
CTJ	WEST GEORGIA RGNL-O V GRAY FIELD	GA	LPV	0	1	0	1	1	0.999934
CVC	COVINGTON MUNICIPAL	GA	LPV	0	1	0	1	1	0.999915
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	1	0	1	0	1
D73	MONROE-WALTON COUNTY	GA	LP	0	1	0	1	1	0.999904
DNN	DALTON MUNICIPAL	GA	LPV	0	1	0	1	2	0.999633
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	1	0	1	0	1
EZM	HEART OF GEORGIA RGNL	GA	LPV	0	1	0	1	0	1
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV200	0	1	0	1	1	0.999950
FTY	FULTON COUNTY AIRPORT-BROWN FIELD	GA	LPV	0	1	0	1	1	0.999915
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	1	0	1	0	1
GVL	LEE GILMER MEMORIAL	GA	LPV	0	1	0	1	2	0.999618
HOE	HOMERVILLE	GA	LPV	0	1	0	1	0	1
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	1	0	1	1	0.999904
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	0	1	0	1	1	0.999888
JES	JESUP-WAYNE COUNTY	GA	LPV	0	1	0	1	0	1
JYL	PLANTATION ARPK	GA	LPV	0	1	0	1	1	0.999981
JZP	PICKENS COUNTY	GA	LPV	0	1	0	1	2	0.999630
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	1	0	1	0	1
LZU	GWINNETT COUNTY-BRISCOE FIELD	GA	LPV200	0	1	0	1	2	0.999711
MAC	MACON DOWNTOWN	GA	LP	0	1	0	1	0	1
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	1	0	1	0	1
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	1	0	1	0	1
MLJ	BALDWIN COUNTY	GA	LPV	0	1	0	1	1	0.999973
MQW	TELFAIR-WHEELER	GA	LPV	0	1	0	1	0	1
OKZ	KAOLIN FIELD	GA	LPV	0	1	0	1	0	1
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	1	0	1	0	1
PIM	HARRIS COUNTY	GA	LPV	0	1	0	1	0	1
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	1	0	1	2	0.999749
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	1	0	1	0	1
RMG	RICHARD B RUSSELL	GA	LPV	0	1	0	1	2	0.999660
RVJ	SWINTON SMITH FLD AT REIDSVILLE MUNICIPAL	GA	LP	0	1	0	1	0	1
RYY	COBB COUNTY-MC COLLUM FIELD	GA	LPV200	0	1	0	1	2	0.999688
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	1	0	1	1	0.999958
SBO	EAST GEORGIA REGIONAL	GA	LPV	0	1	0	1	0	1
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	1	0	1	1	0.999992
TMA	HENRY TIFTON MYERS	GA	LPV	0	1	0	1	0	1
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	1	1	0.999977	2	0.999587
TVI	THOMASVILLE RGNL	GA	LPV	0	1	0	1	0	1
VDI	VIDALIA RGNL	GA	LPV	0	1	0	1	0	1
VLD	VALDOSTA RGNL	GA	LPV	0	1	0	1	0	1
VPC	CARTERSVILLE	GA	LPV	0	1	0	1	2	0.999664
WDR	WINDER-BARROW	GA	LPV	0	1	0	1	2	0.999715

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
AIO	ATLANTIC MUNICIPAL	IA	LPV	2	0.998603	2	0.998457	1	0.998318
ALO	WATERLOO RGNL	IA	LPV	1	0.998306	1	0.998306	1	0.997859
AMW	AMES MUNICIPAL	IA	LPV	1	0.998410	1	0.998337	1	0.998202
AWG	WASHINGTON MUNICIPAL	IA	LPV200	1	0.998484	1	0.998364	1	0.998349
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	1	0.998484	1	0.998380	1	0.998360
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	2	0.998619	2	0.998561	1	0.998318
CID	THE EASTERN IOWA	IA	LPV200	1	0.998476	1	0.998353	1	0.998221
CIN	ARTHUR N NEU	IA	LPV	1	0.998410	1	0.998337	1	0.998194
CKP	CHEROKEE COUNTY RGNL	IA	LPV	1	0.998171	1	0.998171	1	0.997932
CSQ	CRESTON MUNICIPAL	IA	LPV	1	0.998484	1	0.998407	1	0.998337
CWI	CLINTON MUNICIPAL	IA	LPV200	1	0.998453	1	0.998310	1	0.998198
DBQ	DUBUQUE RGNL	IA	LPV200	1	0.998414	1	0.998295	2	0.997994
DEH	DECORAH MUNICIPAL	IA	LPV	1	0.998187	2	0.998152	1	0.997820
DNS	DENISON MUNICIPAL	IA	LPV	1	0.998484	1	0.998337	1	0.998191
DSM	DES MOINES INTL	IA	LPV	1	0.998484	1	0.998337	1	0.998326
DVN	DAVENPORT MUNICIPAL	IA	LPV200	1	0.998461	1	0.998322	1	0.998233
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	1	0.998410	1	0.998337	1	0.997928
EFW	JEFFERSON MUNICIPAL	IA	LPV	1	0.998410	1	0.998337	1	0.998198
EOK	KEOKUK MUNICIPAL	IA	LPV	2	0.998619	1	0.998414	1	0.998383
EST	ESTHERVILLE MUNICIPAL	IA	LPV	1	0.998164	1	0.998164	1	0.997928
FFL	FAIRFIELD MUNICIPAL	IA	LPV	1	0.998484	1	0.998380	1	0.998349
FOD	FORT DODGE RGNL	IA	LPV200	1	0.998410	1	0.998337	1	0.997928
FXY	FOREST CITY MUNICIPAL	IA	LPV	1	0.998175	1	0.998175	1	0.997820
GGI	GRINNELL RGNL	IA	LPV	1	0.998484	1	0.998337	1	0.998218
I75	OSCEOLA MUNICIPAL	IA	LPV	1	0.998484	1	0.998399	1	0.998337
ICL	SCHENCK FIELD	IA	LPV	3	0.998785	2	0.998596	1	0.998414
IIB	INDEPENDENCE MUNICIPAL	IA	LP	1	0.998310	1	0.998310	1	0.997870
IKV	ANKENY RGNL	IA	LPV	1	0.998484	1	0.998337	1	0.998210
IOW	IOWA CITY MUNICIPAL	IA	LPV	1	0.998480	1	0.998356	1	0.998225
LRJ	LE MARS MUNICIPAL	IA	LPV	1	0.998164	1	0.998164	1	0.997932
MCW	MASON CITY MUNICIPAL	IA	LPV200	1	0.998179	1	0.998179	1	0.997820
MPZ	MOUNT PLEASANT MUNICIPALCIPAL	IA	LPV	1	0.998484	1	0.998380	1	0.998356
MUT	MUSCATINE MUNICIPAL	IA	LPV	1	0.998484	1	0.998356	1	0.998341
MXO	MONTICELLO RGNL	IA	LP	1	0.998410	1	0.998306	2	0.998063
OOA	OSKALOOSA MUNICIPAL	IA	LPV	1	0.998484	1	0.998380	1	0.998341
OTM	OTTUMWA RGNL	IA	LPV	1	0.998484	1	0.998380	1	0.998345
OXV	KNOXVILLE MUNICIPAL	IA	LPV	1	0.998484	1	0.998387	1	0.998337
PEA	PELLA MUNICIPAL	IA	LPV	1	0.998484	1	0.998383	1	0.998333
POH	POCAHONTAS MUNICIPAL	IA	LPV	1	0.998179	1	0.998179	1	0.997928
PRO	PERRY MUNICIPAL	IA	LPV200	1	0.998414	1	0.998337	1	0.998225
RDK	RED OAK MUNICIPAL	IA	LPV	2	0.998607	2	0.998546	1	0.998337
SDA	SHENANDOAH MUNICIPAL	IA	LPV	4	0.998943	3	0.998746	3	0.998677
SHL	SHELDON MUNICIPAL	IA	LPV	1	0.998160	1	0.998160	1	0.997932
SKI	SAC CITY MUNICIPAL	IA	LPV	1	0.998295	1	0.998295	1	0.997936
SLB	STORM LAKE MUNICIPAL	IA	LPV	1	0.998183	1	0.998179	1	0.997932
SPW	SPENCER MUNICIPAL	IA	LPV200	1	0.998164	1	0.998164	1	0.997928
SUX	SIOUX GATEWAY/COL BUD DAY FIELD	IA	LPV200	1	0.998299	1	0.998171	1	0.998171
TNU	NEWTON MUNICIPAL	IA	LPV	1	0.998484	1	0.998337	1	0.998218
TVK	CENTERVILLE MUNICIPAL	IA	LPV	1	0.998484	1	0.998391	1	0.998391
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	1	0.998426	1	0.998337	1	0.998218
VTI	VINTON VETERANS MEML ARPK	IA	LPV	1	0.998407	1	0.998318	2	0.998106
BOI	BOISE AIR TERMINAL/GOWEN	ID	LPV	2	0.999842	2	0.999830	5	0.999429

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
	FLD								
COE	PAPPY BOYINGTON FIELD	ID	LPV200	3	0.998264	2	0.998044	3	0.997743
DIJ	DRIGGS-REED MEMORIAL	ID	LP	2	0.999502	3	0.999194	1	0.998611
EUL	CALDWELL INDUSTRIAL	ID	LPV	1	0.999865	1	0.999861	4	0.999464
GNG	GOODING MUNICIPAL	ID	LPV	2	0.999803	2	0.999803	4	0.999506
IDA	IDAHO FALLS RGNL	ID	LPV200	3	0.999718	2	0.999336	2	0.998870
JER	JEROME COUNTY	ID	LPV	2	0.999850	2	0.999850	3	0.999537
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	2	0.998530	2	0.998507	4	0.997986
MAN	NAMPA MUNICIPAL	ID	LPV	2	0.999915	2	0.999846	4	0.999452
MYL	MC CALL MUNICIPALCIPAL	ID	LPV	4	0.999190	4	0.999032	4	0.998171
PIH	POCATELLO RGNL	ID	LPV200	2	0.999819	3	0.999711	3	0.998904
TWF	JOSLIN FIELD-MAGIC VALLEY RGNL	ID	LPV200	2	0.999880	2	0.999880	3	0.999576
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	2	0.999842	2	0.999842	4	0.999510
3LF	LITCHFIELD MUNICIPAL	IL	LPV	2	0.998970	2	0.998650	1	0.998399
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	1	0.998484	1	0.998407	1	0.998341
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	2	0.999005	2	0.998916	1	0.998414
ALN	ST LOUIS RGNL	IL	LPV200	2	0.999020	3	0.998951	1	0.998430
ARR	AURORA MUNICIPAL	IL	LPV200	1	0.998418	1	0.998287	1	0.998206
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	2	0.999155	2	0.999155	1	0.998468
BMI	CENTRAL IL REGL ARPT AT BLOOMINGTON-NORMAL	IL	LPV	2	0.998654	1	0.998410	1	0.998341
C15	PEKIN MUNICIPAL	IL	LPV	2	0.998638	1	0.998410	1	0.998353
C73	DIXON MUNICIPAL-CHARLES R. WALGREEN FLD	IL	LPV	1	0.998438	1	0.998302	1	0.998202
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	1	0.998785	1	0.998465	1	0.998349
CPS	ST LOUIS DOWNTOWN	IL	LPV200	2	0.999090	2	0.999090	1	0.998476
CUL	CARMI MUNICIPAL	IL	LP	2	0.999275	2	0.999140	1	0.998484
DEC	DECATUR	IL	LPV200	1	0.998781	1	0.998457	1	0.998364
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	1	0.998422	1	0.998287	1	0.998202
DNV	VERMILION COUNTY	IL	LPV	2	0.998765	1	0.998484	1	0.998333
DPA	DUPAGE	IL	LPV200	1	0.998414	1	0.998283	1	0.998206
ENL	CENTRALIA MUNICIPAL	IL	LPV	2	0.999124	2	0.999097	1	0.998461
FEP	ALBERTUS	IL	LPV	1	0.998434	1	0.998287	2	0.998133
FOA	FLORA MUNICIPAL	IL	LPV	2	0.999066	2	0.999028	1	0.998414
GBG	GALESBURG MUNICIPAL	IL	LPV200	1	0.998484	1	0.998380	1	0.998345
HSB	HARRISBURG-RALEIGH	IL	LPV	2	0.999414	2	0.999286	1	0.998484
I63	MOUNT STERLING MUNICIPAL	IL	LPV	1	0.998750	1	0.998468	1	0.998387
IGQ	LANSING MUNICIPAL	IL	LPV	1	0.998414	1	0.998283	1	0.998218
IKK	GREATER KANKAKEE	IL	LPV	1	0.998414	1	0.998341	1	0.998306
LOT	LEWIS UNIVERSITY	IL	LPV200	1	0.998414	1	0.998291	1	0.998214
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	2	0.998970	3	0.998823	1	0.998399
MDW	CHICAGO MIDWAY INTL	IL	LPV	1	0.998414	1	0.998275	1	0.998210
MLI	QUAD CITY INTL	IL	LPV200	1	0.998461	1	0.998326	1	0.998326
MTO	COLES COUNTY MEMORIAL	IL	LPV	1	0.998792	1	0.998507	1	0.998368
MVN	MOUNT VERNON	IL	LPV	2	0.999151	2	0.999151	1	0.998480
MWA	WILLIAMSON COUNTY RGNL	IL	LPV200	2	0.999410	2	0.999294	1	0.998484
ORD	CHICAGO-O'HARE INTL	IL	LPV200	1	0.998414	1	0.998275	1	0.998206
PIA	GREATER PEORIA RGNL	IL	LPV	2	0.998615	1	0.998410	1	0.998349
PNT	PONTIAC MUNICIPAL	IL	LPV	1	0.998484	1	0.998410	1	0.998322
PWK	CHICAGO EXECUTIVE	IL	LPV	1	0.998414	1	0.998268	1	0.998202
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	1	0.998426	1	0.998283	2	0.998148

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
RPJ	ROCHELLE MUNICIPAL-KORITZ FIELD	IL	LPV200	1	0.998430	1	0.998295	1	0.998202
RSV	ROBINSON MUNICIPAL	IL	LPV	2	0.998935	1	0.998507	1	0.998376
SAR	SPARTA COMMUNICIPALTY-HUNTER FIELD	IL	LPV	2	0.999313	2	0.999178	2	0.998684
SFY	TRI-TOWNSHIP	IL	LP	1	0.998445	1	0.998299	1	0.998191
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	1	0.998769	1	0.998445	1	0.998376
SQI	WHITESIDE COUNTY-JOS J BITTORF FLD	IL	LPV	1	0.998441	1	0.998306	1	0.998202
UGN	WAUKEGAN RGNL	IL	LPV	1	0.998414	1	0.998256	1	0.998194
UIN	QUINCY RGNL-BALDWIN FIELD	IL	LPV200	1	0.998742	1	0.998488	1	0.998395
4I7	PUTNAM COUNTY	IN	LPV	1	0.998742	1	0.998445	1	0.998337
AID	ANDERSON MUNICIPAL-DARLINGTON FIELD	IN	LPV	2	0.998615	1	0.998337	1	0.998302
ASW	WARSAW MUNICIPALCIPAL	IN	LPV	1	0.998372	1	0.998299	1	0.998268
BAK	COLUMBUS MUNICIPAL	IN	LPV	1	0.998742	1	0.998453	1	0.998337
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	1	0.998827	1	0.998468	1	0.998372
BMG	MONROE COUNTY	IN	LPV200	1	0.998762	1	0.998457	1	0.998360
CEV	METTEL FIELD	IN	LPV	2	0.998669	1	0.998410	1	0.998310
EKM	ELKHART MUNICIPAL	IN	LPV	1	0.998333	1	0.998256	1	0.998221
EVV	EVANSVILLE RGNL	IN	LPV200	2	0.999178	2	0.999128	1	0.998484
EYE	EAGLE CREEK AIRPARK	IN	LPV	1	0.998742	1	0.998445	1	0.998326
FRH	FRENCH LICK MUNICIPAL	IN	LPV	2	0.999020	2	0.998746	1	0.998410
FWA	FORT WAYNE INTL	IN	LPV200	1	0.998376	1	0.998299	1	0.998264
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	1	0.998742	1	0.998445	1	0.998326
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	1	0.998387	1	0.998314	1	0.998295
GSH	GOSHEN MUNICIPAL	IN	LPV	1	0.998341	1	0.998295	1	0.998225
GWB	DE KALB COUNTY	IN	LPV	1	0.998372	1	0.998279	1	0.998252
GYY	GARY/CHICAGO INTL	IN	LPV200	1	0.998414	1	0.998279	1	0.998218
HFY	GREENWOOD MUNICIPAL	IN	LPV	1	0.998742	1	0.998445	1	0.998326
HNB	HUNTINGBURG	IN	LPV	2	0.999101	2	0.998931	1	0.998449
HUF	TERRE HAUTE INTL-HULMAN FIELD	IN	LPV200	1	0.998781	1	0.998457	1	0.998356
I22	RANDOLPH COUNTY	IN	LPV	1	0.998488	1	0.998337	1	0.998287
IMS	MADISON MUNICIPAL	IN	LPV	1	0.998742	1	0.998468	1	0.998372
IND	INDIANAPOLIS INTL	IN	LPV	1	0.998742	1	0.998445	1	0.998326
JVY	CLARK RGNL	IN	LPV200	2	0.998900	2	0.998677	1	0.998418
LAF	PURDUE UNIVERSITY	IN	LPV	2	0.998615	1	0.998410	1	0.998314
MCX	WHITE COUNTY	IN	LP	1	0.998484	1	0.998341	1	0.998299
MIE	DELAWARE COUNTY-JOHNSON FIELD	IN	LPV	1	0.998488	1	0.998337	1	0.998295
MQJ	MOUNT COMFORT	IN	LPV	2	0.998723	1	0.998441	1	0.998318
MZZ	MARION MUNICIPAL	IN	LPV	1	0.998484	1	0.998326	1	0.998291
OKK	KOKOMO MUNICIPAL	IN	LPV200	1	0.998484	1	0.998326	1	0.998295
OVO	NORTH VERNON	IN	LPV	1	0.998742	1	0.998457	1	0.998337
OXI	STARKE COUNTY	IN	LPV	1	0.998387	1	0.998314	1	0.998279
PLD	PORTLAND MUNICIPAL	IN	LPV	1	0.998488	1	0.998337	1	0.998279
RCR	FULTON COUNTY	IN	LPV	1	0.998380	1	0.998306	1	0.998279
RID	RICHMOND MUNICIPAL	IN	LPV200	2	0.998650	1	0.998410	1	0.998302
RZL	JASPER COUNTY	IN	LPV	1	0.998414	1	0.998341	1	0.998299
SBN	SOUTH BEND RGNL	IN	LPV	1	0.998376	1	0.998260	1	0.998221
SER	FREEMAN MUNICIPAL	IN	LPV	1	0.998742	1	0.998457	1	0.998368
SMD	SMITH FIELD	IN	LPV	1	0.998372	1	0.998299	1	0.998256
TEL	PERRY COUNTY MUNICIPAL	IN	LP	2	0.999136	3	0.999074	1	0.998468
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	2	0.998723	1	0.998410	1	0.998314

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
VPZ	PORTER COUNTY MUNICIPAL	IN	LPV	1	0.998391	1	0.998275	1	0.998225
3AU	AUGUSTA MUNICIPAL	KS	LP	0	1	0	1	1	0.999938
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPALCIPAL	KS	LPV	0	1	0	1	1	0.999853
AAO	COLONEL JAMES JABARA	KS	LPV	0	1	0	1	1	0.999927
ADT	ATWOOD-RAWLINS COUNTY CITY-COUNTY	KS	LPV	0	1	0	1	2	0.999676
ANY	ANTHONY MUNICIPAL	KS	LP	0	1	0	1	1	0.999977
CBK	SHALZ FIELD	KS	LPV	0	1	0	1	1	0.999776
CNK	BLOSSER MUNICIPAL	KS	LP	1	0.999996	1	0.999996	3	0.999383
DDC	DODGE CITY RGNL	KS	LPV	0	1	0	1	1	0.999996
EGT	WELLINGTON MUNICIPAL	KS	LPV	0	1	0	1	1	0.999969
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	1	0	1	0	1
EMP	EMPORIA MUNICIPAL	KS	LPV	0	1	0	1	1	0.999850
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	1	0	1	1	0.999861
FOE	FORBES FIELD	KS	LPV	0	1	0	1	2	0.999691
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	1	0	1	2	0.999838
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	1	0	1	1	0.999807
GCK	GARDEN CITY RGNL	KS	LPV	0	1	0	1	1	0.999988
GLD	RENNER FLD/GOODLAND MUNICIPAL/	KS	LPV200	0	1	0	1	1	0.999784
HQG	HUGOTON MUNICIPAL	KS	LPV	0	1	0	1	0	1
HUT	HUTCHINSON MUNICIPAL	KS	LPV	0	1	0	1	1	0.999861
HYS	HAYS RGNL	KS	LPV200	0	1	0	1	1	0.999796
ICT	WICHITA MID-CONTINENT	KS	LPV200	0	1	0	1	1	0.999965
IDP	INDEPENDENCE MUNICIPAL	KS	LPV	0	1	0	1	1	0.999961
IXD	NEW CENTURY AIRCENTER	KS	LPV	1	0.999842	2	0.999823	2	0.999298
K88	ALLEN COUNTY	KS	LPV	0	1	0	1	1	0.999888
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV	0	1	0	1	0	1
LQR	LARNED PAWNEE CO	KS	LPV	0	1	0	1	1	0.999850
LWC	LAWRENCE MUNICIPAL	KS	LPV200	1	0.999873	2	0.999861	5	0.999603
MHK	MANHATTAN RGNL	KS	LPV200	0	1	0	1	2	0.999660
MPR	MCPHERSON	KS	LPV	0	1	0	1	1	0.999815
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	1	0.999973	2	0.999803	2	0.999055
NRN	NORTON MUNICIPAL	KS	LPV	1	0.999958	1	0.999958	2	0.999595
OEL	OAKLEY MUNICIPAL	KS	LPV	0	1	0	1	1	0.999788
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	1	0.999842	2	0.999823	2	0.999271
OWI	OTTAWA MUNICIPAL	KS	LP	0	1	0	1	2	0.999788
PPF	TRI-CITY	KS	LPV	0	1	0	1	1	0.999961
PTS	ATKINSON MUNICIPAL	KS	LPV	0	1	0	1	2	0.999869
PTT	PRATT INDUSTRIAL	KS	LPV	0	1	0	1	1	0.999977
RPB	BELLEVILLE MUNICIPAL	KS	LPV	1	0.999954	1	0.999954	3	0.999290
RSL	RUSSELL MUNICIPAL	KS	LPV	0	1	0	1	1	0.999796
SLN	SALINA MUNICIPAL	KS	LPV	0	1	0	1	1	0.999796
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV200	0	1	2	0.999938	4	0.999676
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	1	0	1	1	0.999819
UKL	COFFEY COUNTY	KS	LPV	0	1	0	1	1	0.999865
ULS	ULYSSES	KS	LPV	0	1	0	1	0	1
27K	GEORGETOWN SCOTT CO-MARSHALL FLD	KY	LPV200	1	0.998742	1	0.998495	1	0.998391
2I0	MADISONVILLE MUNICIPAL	KY	LPV	2	0.999414	2	0.999375	1	0.998557
6I2	LEBANON-SPRINGFIELD	KY	LP	2	0.999147	3	0.998962	1	0.998445
7K4	OHIO COUNTY	KY	LPV	2	0.999410	2	0.999371	1	0.998538
AAS	TAYLOR COUNTY	KY	LP	2	0.999259	3	0.999140	1	0.998484
BRY	SAMUELS FIELD	KY	LPV	2	0.999113	3	0.998962	1	0.998434

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BWG	BOWLING GREEN-WARREN CTY RGNL	KY	LPV	2	0.999406	2	0.999406	2	0.998623
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	2	0.999371	3	0.999240	2	0.998657
CEY	KYLE-OAKLEY FIELD	KY	LPV	3	0.999753	3	0.999707	2	0.998816
CPF	WENDELL H FORD	KY	LPV200	2	0.998943	2	0.998727	1	0.998426
CVG	CINCINNATI/NORTHERN KENTUCKY INTL	KY	LPV200	1	0.998742	1	0.998449	1	0.998322
DVK	STUART POWELL FIELD	KY	LPV	2	0.999132	3	0.998943	1	0.998441
DWU	ASHLAND RGNL	KY	LP	1	0.998704	1	0.998445	1	0.998337
EHR	HENDERSON CITY-COUNTY	KY	LPV	2	0.999306	2	0.999267	1	0.998484
EKX	ADDINGTON FIELD	KY	LPV	2	0.999186	3	0.999016	1	0.998484
FGX	FLEMING-MASON	KY	LPV	1	0.998704	1	0.998457	1	0.998341
GLW	GLASGOW MUNICIPAL	KY	LPV	2	0.999387	3	0.999340	2	0.998619
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	2	0.999452	2	0.999414	2	0.998789
I39	MADISON	KY	LPV200	2	0.999086	3	0.998912	1	0.998441
K22	BIG SANDY RGNL	KY	LPV	1	0.998723	1	0.998465	1	0.998356
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	2	0.999159	2	0.999113	1	0.998480
LEX	BLUE GRASS	KY	LPV	2	0.998900	2	0.998661	1	0.998403
LOU	BOWMAN FIELD	KY	LPV	2	0.998927	2	0.998700	1	0.998422
LOZ	LONDON-CORBIN ARPT-MAGEE FLD	KY	LPV	2	0.999252	3	0.999124	1	0.998461
M21	MUHLENBERG COUNTY	KY	LP	2	0.999414	2	0.999375	1	0.998557
M97	MOREHEAD-ROWAN COUNTY CLYDE A THOMAS RGNL	KY	LPV	1	0.998723	1	0.998488	1	0.998360
OWB	OWENSBORO-DAVIESS COUNTY	KY	LPV200	2	0.999371	2	0.999255	1	0.998484
PAH	BARKLEY RGNL	KY	LPV	3	0.999568	2	0.999375	2	0.998816
SDF	LOUISVILLE INTL-STANDIFORD FLD	KY	LPV200	2	0.998943	2	0.998738	1	0.998422
SME	LAKE CUMBERLAND RGNL	KY	LPV	2	0.999333	3	0.999221	1	0.998488
TWT	STURGIS MUNICIPAL	KY	LPV	2	0.999414	2	0.999375	1	0.998557
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	2	0.999452	3	0.999371	2	0.998650
1L0	ST JOHN THE BAPTIST PARISH	LA	LPV	0	1	0	1	1	0.999961
3R4	HART	LA	LPV	0	1	0	1	0	1
ACP	ALLEN PARISH	LA	LPV	0	1	0	1	1	0.999985
AEX	ALEXANDRIA INTL	LA	LPV200	0	1	0	1	1	0.999988
ARA	ACADIANA RGNL	LA	LPV	0	1	0	1	1	0.999973
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	1	0	1	0	1
BTR	BATON ROUGE METRO	LA	LPV200	0	1	0	1	1	0.999973
BXA	GEORGE R CARR MEMORIAL AIR FIELD	LA	LPV	0	1	0	1	1	0.999973
CWF	CHENNAULT INTL	LA	LPV200	0	1	0	1	1	0.999981
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	1	0	1	0	1
ESF	ESLER RGNL	LA	LPV200	0	1	0	1	1	0.999985
F88	JONESBORO	LA	LP	0	1	0	1	0	1
GAO	SOUTH LAFOURCHE LEONARD MILLER JR	LA	LPV	0	1	0	1	1	0.999946
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	1	0	1	1	0.999973
HUM	HOUMA-TERREBONNE	LA	LPV200	0	1	0	1	1	0.999946
HZR	FALSE RIVER RGNL	LA	LPV	0	1	0	1	1	0.999973
IER	NATCHITOCHES RGNL	LA	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	0	1	0	1	1	0.999973
L38	LOUISIANA RGNL	LA	LPV	0	1	0	1	1	0.999973
L39	LEESVILLE	LA	LPV	0	1	0	1	1	0.999996
LCH	LAKE CHARLES RGNL	LA	LPV200	0	1	0	1	1	0.999973
LFT	LAFAYETTE RGNL	LA	LPV	0	1	0	1	1	0.999973
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	1	0	1	0	1
MLU	MONROE RGNL	LA	LPV200	0	1	0	1	0	1
MSY	LOUIS ARMSTRONG NEW ORLEANS INTL	LA	LPV200	0	1	0	1	1	0.999946
NEW	LAKEFRONT	LA	LPV	0	1	0	1	1	0.999946
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	0	1	0	1	1	0.999973
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	1	0	1	2	0.999969
RSN	RUSTON RGNL AIRPORT	LA	LPV	0	1	0	1	0	1
SHV	SHREVEPORT RGNL	LA	LPV200	0	1	0	1	0	1
SPH	SPRINGHILL	LA	LPV	0	1	0	1	1	0.999996
TVR	VICKSBURG TALLULAH RGNL	LA	LPV	0	1	0	1	1	0.999992
UXL	SOUTHLAND FIELD	LA	LPV	0	1	0	1	1	0.999985
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	2	0.998202	3	0.998152	5	0.997195
ACK	NANTUCKET MEMORIAL	MA	LPV200	2	0.998225	2	0.997994	5	0.997195
BAF	BARNES MUNICIPAL	MA	LPV	2	0.998241	3	0.998171	5	0.997184
BED	LAURENCE G HANSCOM FLD	MA	LPV200	2	0.998110	1	0.997905	5	0.997191
BOS	GEN EDWARD LAWRENCE LOGAN INTL	MA	LPV200	2	0.998110	1	0.997897	5	0.997157
BVY	BEVERLY MUNICIPAL	MA	LPV	1	0.997897	1	0.997897	5	0.997153
EWB	NEW BEDFORD RGNL	MA	LP	2	0.998202	1	0.997894	5	0.997195
GBR	WALTER J KOLADZA	MA	LP	1	0.998256	3	0.998198	6	0.997404
HYA	BARNSTABLE MUNICIPAL-BOARDMAN/POLANDO FIELD	MA	LPV200	2	0.998171	1	0.997874	5	0.997176
LWM	LAWRENCE MUNICIPAL	MA	LPV200	1	0.997901	1	0.997901	5	0.997157
MVY	MARTHAS VINEYARD	MA	LPV200	2	0.998241	2	0.998005	5	0.997191
ORE	ORANGE MUNICIPAL	MA	LPV	2	0.998156	3	0.998098	5	0.997176
ORH	WORCESTER RGNL	MA	LPV200	2	0.998164	2	0.998113	5	0.997191
OWD	NORWOOD MEMORIAL	MA	LPV	2	0.998152	1	0.997901	5	0.997180
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	2	0.998167	1	0.997890	5	0.997168
2G4	GARRETT COUNTY	MD	LPV	1	0.998441	1	0.998333	1	0.998221
2W6	ST. MARY'S COUNTY RGNL	MD	LPV	1	0.998368	1	0.998299	2	0.998198
BWI	BALTIMORE/WASHINGTON INTL THURGOOD MARSHALL	MD	LPV200	1	0.998368	1	0.998260	2	0.998210
CBE	GREATER CUMBERLAND RGNL	MD	LP	1	0.998441	1	0.998333	1	0.998221
DMW	CARROLL COUNTY REGNL/JACK B POAGE FIELD	MD	LPV200	1	0.998368	1	0.998256	2	0.998218
ESN	EASTON/NEWNAM FIELD	MD	LPV	1	0.998368	1	0.998299	1	0.998221
FDK	FREDERICK MUNICIPAL	MD	LPV	1	0.998368	1	0.998260	2	0.998194
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	1	0.998368	1	0.998260	2	0.998183
HGR	HAGERSTOWN RGNL-RICHARD A HENSON FIELD	MD	LPV200	1	0.998368	1	0.998256	2	0.998210
MTN	MARTIN STATE	MD	LPV	1	0.998368	1	0.998260	1	0.998221
OXB	OCEAN CITY MUNICIPAL	MD	LPV	1	0.998368	1	0.998299	1	0.998225
SBY	SALISBURY-OCEAN CITY WICOMICO RGNL	MD	LPV200	1	0.998368	1	0.998299	1	0.998225
1B0	DEXTER RGNL	ME	LP	1	0.997562	1	0.997411	6	0.996941
81B	OXFORD COUNTY RGNL	ME	LP	1	0.997797	2	0.997724	6	0.996995

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
AUG	AUGUSTA STATE	ME	LPV200	1	0.997793	2	0.997728	6	0.996964
BGR	BANGOR INTL	ME	LPV	1	0.997562	1	0.997411	6	0.996929
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	1	0.997566	1	0.997411	6	0.996914
BXM	BRUNSWICK EXECUTIVE	ME	LPV	1	0.997843	1	0.997766	6	0.996998
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV	1	0.997218	1	0.997191	7	0.996184
HUL	HOULTON INTL	ME	LP	1	0.997257	1	0.997257	8	0.996570
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	1	0.997820	1	0.997762	6	0.997002
MLT	MILLINOCKET MUNICIPAL	ME	LPV	1	0.997373	1	0.997299	8	0.996678
PQI	NORTHERN MAINE RGNL ARPT AT PRESQUE IS	ME	LPV200	1	0.997218	1	0.997218	7	0.996389
PWM	PORTLAND INTL JETPORT	ME	LPV200	1	0.997847	1	0.997809	6	0.997045
RKD	KNOX COUNTY RGNL	ME	LPV	1	0.997801	2	0.997735	6	0.996971
SFM	SANFORD RGNL	ME	LPV200	1	0.997851	1	0.997851	6	0.997056
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	1	0.997785	2	0.997697	6	0.996960
77G	MARLETTE	MI	LPV	1	0.998299	1	0.998156	2	0.998017
9D9	HASTINGS	MI	LP	1	0.998310	1	0.998214	1	0.998202
ACB	ANTRIM COUNTY	MI	LPV	1	0.998137	1	0.998137	4	0.997670
ADG	LENAWEE COUNTY	MI	LPV	1	0.998302	1	0.998264	1	0.998218
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	1	0.998299	1	0.998191	1	0.998183
ANJ	SAULT STE MARIE MUNICIPAL - SANDERSON FIELD	MI	LPV	2	0.997685	3	0.997423	3	0.997106
APN	ALPENA COUNTY RGNL	MI	LPV	2	0.998225	3	0.998187	4	0.997693
ARB	ANN ARBOR MUNICIPAL	MI	LPV	1	0.998299	1	0.998218	2	0.998191
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV	1	0.998333	1	0.998229	1	0.998210
BAX	HURON COUNTY MEMORIAL	MI	LPV	1	0.998299	1	0.998148	2	0.997990
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	1	0.998376	1	0.998248	1	0.998210
BIV	TULIP CITY	MI	LPV	1	0.998326	1	0.998221	1	0.998194
BTL	W K KELLOGG	MI	LPV200	1	0.998310	1	0.998221	1	0.998210
CAD	WEXFORD COUNTY	MI	LPV200	1	0.998164	1	0.998160	3	0.997793
CIU	CHIPPEWA COUNTY INTL	MI	LPV	2	0.997689	3	0.997434	3	0.997133
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	2	0.997523	2	0.997442	4	0.996952
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	1	0.998063	2	0.998048	4	0.997635
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	1	0.998299	1	0.998218	1	0.998032
DTW	DETROIT METROPOLITAN WAYNE COUNTY	MI	LPV200	1	0.998299	1	0.998221	2	0.998175
ERY	LUCE COUNTY	MI	LPV	2	0.997720	3	0.997461	4	0.997114
ESC	DELTA COUNTY	MI	LPV200	2	0.997847	2	0.997785	5	0.997380
FFX	FREMONT MUNICIPAL	MI	LPV	1	0.998194	1	0.998183	1	0.998179
FNT	BISHOP INTL	MI	LPV200	1	0.998299	1	0.998202	1	0.998052
GDW	GLADWIN ZETTEL MEMORIAL	MI	LP	1	0.998299	1	0.998156	4	0.997994
GLR	GAYLORD RGNL	MI	LPV	1	0.998125	1	0.998125	4	0.997670
GRR	GERALD R. FORD INTL	MI	LPV200	1	0.998310	1	0.998206	1	0.998194
HYX	SAGINAW COUNTY H.W. BROWNE	MI	LPV	1	0.998299	1	0.998164	2	0.998040
IKW	JACK BARSTOW	MI	LPV	1	0.998299	1	0.998164	2	0.998125
IMT	FORD	MI	LPV	2	0.997847	2	0.997789	6	0.997485
IRS	KIRSCH MUNICIPAL	MI	LPV	1	0.998333	1	0.998241	1	0.998221
ISQ	SCHOOLCRAFT COUNTY	MI	LP	2	0.997778	2	0.997770	5	0.997319
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	2	0.997813	3	0.997724	4	0.997025
JXN	JACKSON COUNTY-REYNOLDS	MI	LPV200	1	0.998299	1	0.998214	1	0.998210

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
	FIELD								
LAN	CAPITAL REGION INTL	MI	LPV200	1	0.998299	1	0.998202	1	0.998198
LDM	MASON COUNTY	MI	LPV	1	0.998187	1	0.998167	3	0.997990
LWA	SOUTH HAVEN AREA RGNL	MI	LP	1	0.998333	1	0.998237	1	0.998206
MBS	MBS INTL	MI	LPV200	1	0.998299	1	0.998164	2	0.998048
MCD	MACKINAC ISLAND	MI	LPV	2	0.997739	3	0.997728	4	0.997334
MKG	MUSKEGON COUNTY	MI	LPV200	1	0.998322	1	0.998210	1	0.998187
MNM	MENOMINEE-MARINETTE TWIN COUNTY	MI	LPV200	2	0.998056	1	0.997820	4	0.997689
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	1	0.998299	1	0.998171	1	0.998140
N98	BOYNE CITY MUNICIPAL	MI	LP	1	0.998075	2	0.998071	4	0.997650
OEB	BRANCH COUNTY MEMORIAL	MI	LPV	1	0.998333	1	0.998233	1	0.998221
OSC	OSCODA-WURTSMITH	MI	LPV200	1	0.998260	1	0.998129	4	0.997770
OZW	LIVINGSTON COUNTY SPENCER J. HARDY	MI	LPV200	1	0.998299	1	0.998210	1	0.998194
PHN	SAINT CLAIR COUNTY INTL	MI	LPV200	1	0.998299	1	0.998206	1	0.998025
PLN	PELLSTON RGNL AIRPORT OF EMMET COUNTY	MI	LPV200	3	0.997978	3	0.997967	4	0.997465
PTK	OAKLAND COUNTY INTL	MI	LPV200	1	0.998299	1	0.998210	1	0.998044
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	1	0.998299	1	0.998198	1	0.998183
SAW	SAWYER INTL	MI	LPV200	2	0.997770	2	0.997531	4	0.997068
SLH	CHEBOYGAN COUNTY	MI	LPV	3	0.997986	3	0.997963	4	0.997369
TTF	CUSTER	MI	LPV	1	0.998299	1	0.998264	2	0.998187
TVC	CHERRY CAPITAL	MI	LPV	1	0.998148	1	0.998148	4	0.997701
YIP	WILLOW RUN	MI	LPV	1	0.998299	1	0.998218	2	0.998175
AEL	ALBERT LEA MUNICIPAL	MN	LPV	1	0.998167	1	0.998167	1	0.997820
ANE	ANOKA COUNTY-BLAINE ARPT (JANES FIELD)	MN	LPV	1	0.998098	1	0.997894	2	0.997774
AUM	AUSTIN MUNICIPAL	MN	LPV200	1	0.998171	1	0.998171	1	0.997820
AXN	CHANDLER FIELD	MN	LPV	1	0.998067	1	0.997897	3	0.997801
BBB	BENSON MUNICIPAL	MN	LPV	1	0.998075	1	0.997897	1	0.997894
BDE	BAUDETTE INTL	MN	LPV	1	0.997562	1	0.997454	6	0.996894
BDH	WILLMAR MUNICIPAL-JOHN L RICE FIELD	MN	LPV	1	0.998086	2	0.998017	1	0.997894
BJI	BEMIDJI RGNL	MN	LPV200	1	0.997650	1	0.997542	4	0.997114
BRD	BRAINERD LAKES RGNL	MN	LPV200	1	0.998005	2	0.997801	3	0.997411
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	1	0.998052	1	0.997894	3	0.997743
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	1	0.997353	2	0.997334	5	0.996848
CKN	CROOKSTON MUNICIPAL/KIRKWOOD FLD	MN	LPV	1	0.997643	1	0.997527	5	0.997099
CNB	MYERS FIELD	MN	LPV	1	0.998090	1	0.998090	1	0.997890
COQ	CLOQUET CARLTON COUNTY	MN	LPV	2	0.997882	2	0.997724	3	0.997157
CQM	COOK MUNICIPAL	MN	LP	1	0.997573	1	0.997477	5	0.996898
D39	SAUK CENTRE MUNICIPAL	MN	LP	1	0.998075	1	0.997897	3	0.997778
DLH	DULUTH INTL	MN	LPV200	2	0.997801	2	0.997677	4	0.997103
DTL	DETROIT LAKES-WETHING FIELD	MN	LPV	1	0.997720	1	0.997550	4	0.997454
DXX	LAC QUI PARLE COUNTY	MN	LPV200	1	0.998079	1	0.998079	1	0.997890
ELO	ELY MUNICIPAL	MN	LPV200	1	0.997550	1	0.997481	5	0.996887
ETH	WHEATON MUNICIPAL	MN	LP	1	0.998059	1	0.997932	3	0.997793
FCM	FLYING CLOUD	MN	LPV200	1	0.998106	1	0.997820	2	0.997809
FFM	FERGUS FALLS MUNICIPAL-EINAR MICKELSON FLD	MN	LPV200	1	0.998052	2	0.997843	4	0.997539
FKA	FILLMORE COUNTY	MN	LPV	1	0.998175	2	0.998113	1	0.997820
FOZ	BIGFORK MUNICIPALCIPAL	MN	LP	1	0.997585	1	0.997473	5	0.997049

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
FRM	FAIRMONT MUNICIPAL	MN	LPV	1	0.998160	1	0.998160	1	0.997928
FSE	FOSSTON MUNICIPAL	MN	LP	1	0.997647	1	0.997535	4	0.997106
GPZ	GRAND RAPIDS/ITASCA CO-GORDON NEWSTROM	MN	LPV	1	0.997596	1	0.997485	3	0.997130
HCD	HUTCHINSON MUNICIPAL-BUTLER FIELD	MN	LPV	1	0.998098	2	0.998056	1	0.997894
HIB	RANGE RGNL	MN	LPV200	1	0.997596	1	0.997481	5	0.997060
INL	FALLS INTL	MN	LPV	1	0.997485	1	0.997411	6	0.996809
JKJ	MOORHEAD MUNICIPAL	MN	LPV	1	0.997708	1	0.997550	3	0.997481
LJF	LITCHFIELD MUNICIPAL	MN	LPV	1	0.998090	1	0.997897	1	0.997894
LVN	AIRLAKE	MN	LPV200	1	0.998110	2	0.997955	2	0.997809
LXL	LITTLE FALLS/MORRISON CO-LINDBERGH FLD	MN	LPV	1	0.998071	2	0.997874	4	0.997758
LYV	QUENTIN AANENSON FIELD	MN	LPV200	1	0.998144	1	0.998144	2	0.997890
MGG	MAPLE LAKE MUNICIPAL	MN	LP	1	0.998090	1	0.997897	2	0.997785
MKT	MANKATO RGNL	MN	LPV200	1	0.998113	1	0.998113	1	0.997820
MML	SOUTHWEST MINNESOTA RGNL MARSHALL/RYAN FIELD	MN	LPV200	1	0.998094	1	0.998094	1	0.997894
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN	MN	LPV200	1	0.998106	1	0.997820	2	0.997782
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	1	0.997959	2	0.997735	3	0.997272
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	1	0.998133	2	0.998021	2	0.997816
ORB	ORR RGNL	MN	LP	1	0.997554	1	0.997473	5	0.996863
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	1	0.998148	1	0.998148	1	0.997894
OWA	OWATONNA DEGNER RNGL	MN	LPV200	1	0.998121	1	0.998121	1	0.997820
PKD	PARK RAPIDS MUNICIPAL-KONSHOK FIELD	MN	LPV200	1	0.997685	1	0.997554	3	0.997315
RGK	RED WING RGNL	MN	LPV200	1	0.998117	2	0.997963	2	0.997793
ROS	RUSH CITY RGNL	MN	LPV	1	0.998005	1	0.997894	4	0.997693
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FIELD	MN	LPV	1	0.997550	1	0.997442	6	0.996964
RRT	WARROAD INTL MEMORIAL	MN	LPV	1	0.997550	1	0.997442	6	0.996917
RST	ROCHESTER INTL	MN	LPV200	1	0.998137	2	0.998036	1	0.997820
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	1	0.998098	1	0.998098	1	0.997894
SAZ	STAPLES MUNICIPAL	MN	LPV	1	0.998059	2	0.997793	3	0.997485
STC	ST CLOUD RGNL	MN	LPV200	1	0.998083	1	0.997897	3	0.997751
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	1	0.998106	1	0.997820	2	0.997782
TVF	THIEF RIVER FALLS	MN	LPV	1	0.997635	1	0.997527	5	0.997087
TWM	RICHARD B HELGESON	MN	LPV	2	0.997801	2	0.997647	4	0.996941
VVV	ORTONVILLE MUNICIPAL-MARTINSON FIELD	MN	LP	1	0.998071	1	0.998071	1	0.997890
1H0	CREVE COEUR	MO	LPV	2	0.999066	2	0.999066	1	0.998468
2H2	JERRY SUMNERS SR AURORA MUNICIPALCIPAL	MO	LP	0	1	0	1	3	0.999749
6M6	LEWIS COUNTY RGNL	MO	LPV	2	0.998870	2	0.998553	1	0.998395
8WC	WASHINGTON COUNTY AIRPORT	MO	LPV	2	0.999379	2	0.999336	2	0.998769
AIZ	LEE C FINE MEMORIAL	MO	LPV	1	0.999718	3	0.999510	2	0.998700
BBG	BRANSON	MO	LPV200	0	1	0	1	3	0.999803
BUM	BUTLER MEMORIAL	MO	LPV	1	0.999919	3	0.999907	3	0.999151
CGI	CAPE GIRARDEAU RGNL	MO	LPV	3	0.999660	2	0.999375	2	0.998831
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	3	0.999209	3	0.998997	1	0.998465
COU	COLUMBIA RGNL	MO	LPV	2	0.999460	2	0.999101	1	0.998519

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
DMO	SEDALIA MEMORIAL	MO	LPV	1	0.999633	3	0.999367	1	0.998549
DXE	DEXTER MUNICIPAL	MO	LPV	0	1	1	0.999880	2	0.998858
EIW	COUNTY MEMORIAL	MO	LPV	0	1	1	0.999884	3	0.999066
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	1	0	1	2	0.999950
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	4	0.999109	3	0.998970	2	0.998615
EZZ	CAMERON MEMORIAL	MO	LPV	2	0.999398	4	0.999286	1	0.998492
FAM	FARMINGTON RGNL	MO	LPV	2	0.999425	2	0.999329	2	0.998777
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	3	0.999352	2	0.999090	2	0.998630
FWB	BRANSON WEST MUNICIPAL-EMERSON FIELD	MO	LPV200	0	1	0	1	3	0.999776
FYG	WASHINGTON RGNL	MO	LPV	2	0.999120	2	0.999105	2	0.998638
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	1	0.999491	4	0.999398	2	0.998750
H21	CAMDENTON MEMORIAL	MO	LPV	1	0.999838	3	0.999711	3	0.998877
H79	ELDON MODEL AIRPARK	MO	LP	2	0.999630	3	0.999471	1	0.998542
HAE	HANNIBAL RGNL	MO	LPV	2	0.998935	3	0.998785	1	0.998407
HFJ	MONETT MUNICIPAL	MO	LPV	0	1	0	1	3	0.999865
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	1	0.999633	3	0.999360	2	0.998688
IRK	KIRKSVILLE RGNL	MO	LPV200	2	0.998908	2	0.998681	1	0.998426
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	2	0.999587	3	0.999298	2	0.998650
JLN	JOPLIN RGNL	MO	LPV	0	1	0	1	2	0.999869
K02	PERRYVILLE MUNICIPAL	MO	LPV	2	0.999410	2	0.999313	2	0.998692
K57	GOULD PETERSON MUNICIPAL	MO	LPV	4	0.999097	4	0.999059	3	0.998796
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	1	0.999753	3	0.999722	3	0.999132
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	1	0.999676	3	0.999591	3	0.999093
M05	CARUTHERSVILLE MEM	MO	LPV	0	1	1	0.999973	5	0.999556
M17	BOLIVAR MUNICIPAL	MO	LPV	0	1	2	0.999965	2	0.999109
M48	HOUSTON MEMORIAL	MO	LPV	1	0.999981	3	0.999900	2	0.998912
MAW	MALDEN MUNICIPAL	MO	LPV	0	1	1	0.999896	2	0.998885
MBY	OMAR N BRADLEY	MO	LPV	2	0.999043	3	0.998958	1	0.998434
MCI	KANSAS CITY INTL	MO	LPV	1	0.999633	3	0.999591	3	0.999039
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	2	0.999502	3	0.999302	1	0.998546
MKC	CHARLES B. WHEELER DOWNTOWN	MO	LPV200	1	0.999668	3	0.999630	2	0.999086
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	2	0.999032	3	0.998947	1	0.998449
MYJ	MEXICO MEMORIAL	MO	LPV	3	0.999167	3	0.999001	1	0.998461
NVD	NEVADA MUNICIPAL	MO	LPV200	0	1	1	0.999996	3	0.999672
PLK	M. GRAHAM CLARK DOWNTOWN	MO	LPV200	0	1	0	1	3	0.999772
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	0	1	1	0.999900	2	0.998870
RCM	SKYHAVEN	MO	LPV	1	0.999641	3	0.999537	3	0.998897
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV	0	1	1	0.999981	4	0.999579
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	2	0.999942	3	0.999645	2	0.998831
STJ	ROSECRANS MEMORIAL	MO	LPV200	1	0.999410	3	0.999360	2	0.998723
STL	LAMBERT-ST LOUIS INTL	MO	LPV200	2	0.999063	2	0.999063	1	0.998465
SUS	SPIRIT OF ST LOUIS	MO	LPV200	2	0.999090	2	0.999086	2	0.998611
TBN	WAYNESVILLE-ST ROBERT RGNL/FORNEY AAF	MO	LPV	1	0.999842	3	0.999529	2	0.998746
TRX	TRENTON MUNICIPAL	MO	LPV	2	0.999005	3	0.998924	1	0.998461
UBX	CUBA MUNICIPAL	MO	LPV	2	0.999599	3	0.999464	2	0.998688
UNO	WEST PLAINS MUNICIPAL	MO	LPV	0	1	1	0.999938	2	0.999097
UUV	SULLIVAN RGNL	MO	LPV	3	0.999475	2	0.999252	2	0.998646

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
VER	JESSE VIERTEL MEMORIAL	MO	LPV	2	0.999483	3	0.999286	1	0.998534
VIH	ROLLA NATIONAL	MO	LPV200	2	0.999610	3	0.999464	2	0.998688
87I	YAZOO COUNTY	MS	LPV	0	1	0	1	0	1
CKM	FLETCHER FIELD	MS	LPV	0	1	0	1	1	0.999981
CRX	ROSCOE TURNER	MS	LPV200	0	1	0	1	2	0.999888
GLH	MID DELTA RGNL	MS	LPV200	0	1	0	1	1	0.999996
GNF	GRENADA MUNICIPAL	MS	LPV	0	1	0	1	0	1
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	1	0	1	1	0.999958
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	1	0	1	0	1
GWO	GREENWOOD-LEFLORE	MS	LPV	0	1	0	1	0	1
HBG	HATTIESBURG BOBBY L. CHAIN MUNICIPAL	MS	LPV200	0	1	0	1	1	0.999988
HEZ	HARDY-ANDERS FLD NATCHEZ-ADAMS COUNTY	MS	LPV	0	1	0	1	1	0.999977
HKS	HAWKINS FIELD	MS	LPV200	0	1	0	1	1	0.999996
HSA	STENNIS INTL	MS	LPV200	0	1	0	1	1	0.999958
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	1	0	1	0	1
JAN	JACKSON-EVERS INTL	MS	LPV200	0	1	0	1	0	1
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	1	0	1	1	0.999996
LUL	HESLER-NOBLE FIELD	MS	LPV	0	1	0	1	0	1
M40	MONROE COUNTY	MS	LPV	0	1	0	1	1	0.999996
M43	PRENTISS-JEFFERSON DAVIS COUNTY	MS	LPV	0	1	0	1	1	0.999996
MCB	MC COMB-PIKE COUNTY-JOHN E LEWIS FIELD	MS	LPV	0	1	0	1	1	0.999981
MEI	KEY FIELD	MS	LPV200	0	1	0	1	0	1
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	1	0	1	1	0.999954
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	1	0	1	0	1
OLV	OLIVE BRANCH	MS	LPV	0	1	0	1	1	0.999973
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	0	1	0	1	1	0.999988
PQL	TRENT LOTT INTL	MS	LPV200	0	1	0	1	1	0.999969
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	1	0	1	1	0.999996
STF	GEORGE M BRYAN	MS	LPV200	0	1	0	1	0	1
TUP	TUPELO RGNL	MS	LPV200	0	1	0	1	1	0.999938
UOX	UNIVERSITY-OXFORD	MS	LPV	0	1	0	1	1	0.999988
UTA	TUNICA MUNICIPAL	MS	LPV200	0	1	0	1	1	0.999973
1S3	TILLITT FIELD	MT	LPV	1	0.998221	1	0.998221	2	0.997978
4U6	CIRCLE TOWN COUNTY	MT	LPV	1	0.998079	2	0.998067	2	0.997716
6S8	LAUREL MUNICIPALCIPAL	MT	LPV	2	0.998387	2	0.998387	2	0.998202
7S0	RONAN	MT	LPV	2	0.998353	2	0.998318	3	0.997924
BIL	BILLINGS LOGAN INTL	MT	LPV200	2	0.998387	2	0.998387	2	0.998160
BTM	BERT MOONEY	MT	LPV	2	0.998449	2	0.998368	2	0.998164
BZN	GALLATIN FIELD	MT	LPV	2	0.998438	2	0.998391	3	0.998221
GDV	DAWSON COMMUNICIPALTY	MT	LPV	1	0.998079	2	0.998059	2	0.997701
GGW	WOKAL FIELD/GLASGOW INTL	MT	LPV200	1	0.998075	2	0.997982	3	0.997554
GPI	GLACIER PARK INTL	MT	LPV	2	0.998353	1	0.998198	3	0.997836
GTF	GREAT FALLS INTL	MT	LPV200	2	0.998376	1	0.998225	3	0.997955
HLN	HELENA RGNL	MT	LPV	2	0.998356	2	0.998356	3	0.998083
HVR	HAVRE CITY-COUNTY	MT	LPV	1	0.998125	1	0.998040	4	0.997623
LVM	MISSION FIELD	MT	LP	2	0.998387	2	0.998387	3	0.998225
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	2	0.998380	1	0.998225	2	0.998036
M75	MALTA	MT	LP	1	0.998094	2	0.997998	3	0.997585
MLS	FRANK WILEY FIELD	MT	LPV	1	0.998183	1	0.998183	2	0.997971
MSO	MISSOULA INTL	MT	LPV	2	0.998356	2	0.998329	2	0.998059
OLF	L M CLAYTON	MT	LPV200	1	0.998075	2	0.997975	4	0.997515

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
PWD	SHER-WOOD	MT	LPV200	1	0.998002	2	0.997951	3	0.997365
RPX	ROUNDUP	MT	LPV	2	0.998387	2	0.998387	2	0.998040
SBX	SHELBY	MT	LP	1	0.998225	1	0.998225	4	0.997716
SDY	SIDNEY-RICHLAND MUNICIPAL	MT	LPV	1	0.998079	2	0.998005	2	0.997616
WYS	YELLOWSTONE	MT	LPV200	3	0.998735	2	0.998457	1	0.998233
CYCL	CHARLO	NB	LPV	1	0.997091	2	0.997018	8	0.995941
CYQM	MONCTON INTL	NB	LPV	1	0.997218	1	0.997083	9	0.996061
AFP	ANSON COUNTY-JEFF CLOUD FLD	NC	LPV	1	0.999823	2	0.999745	3	0.999363
AKH	GASTONIA MUNICIPAL	NC	LPV	1	0.999799	2	0.999707	3	0.999410
AVL	ASHEVILLE RGNL	NC	LPV	1	0.999753	2	0.999676	3	0.999475
BUY	BURLINGTON-ALAMANCE RGNL	NC	LPV200	3	0.999576	3	0.999186	3	0.998692
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	1	0.999799	2	0.999711	3	0.999329
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	1	0.999742	2	0.999660	3	0.998912
DPL	DUPLIN COUNTY	NC	LPV200	1	0.999738	2	0.999645	3	0.998885
ECG	ELIZABETH CITY CG AIR STATION/RGNL	NC	LPV	3	0.998858	3	0.998769	1	0.998337
EDE	NORTHEASTERN RGNL	NC	LPV200	3	0.999043	3	0.998889	2	0.998480
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	1	0.999788	2	0.999688	3	0.999433
EQY	MONROE RGNL	NC	LPV	1	0.999823	2	0.999749	3	0.999325
EWN	COASTAL CAROLINA RGNL	NC	LPV	1	0.999730	2	0.999599	3	0.998870
EXX	DAVIDSON COUNTY	NC	LPV	1	0.999676	2	0.999572	3	0.998947
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	1	0.999811	2	0.999749	3	0.999113
FAY	FAYETTEVILLE RGNL/GRANNIS FIELD	NC	LPV200	1	0.999769	2	0.999684	4	0.999097
FQD	RUTHERFORD CO/MARCHMAN FIELD	NC	LPV	1	0.999742	2	0.999653	3	0.999425
GSO	PIEDMONT TRIAD INTL	NC	LPV200	3	0.999556	3	0.999244	2	0.998642
GWW	WAYNE EXECUTIVE JETPORT	NC	LPV200	1	0.999645	2	0.999537	3	0.998881
HKY	HICKORY RGNL	NC	LPV200	1	0.999699	2	0.999603	3	0.999093
HNZ	HENDERSON-OXFORD	NC	LPV	3	0.999035	3	0.998885	1	0.998337
HRJ	HARNETT COUNTY	NC	LPV	1	0.999684	2	0.999587	3	0.998958
ILM	WILMINGTON INTL	NC	LPV200	1	0.999811	2	0.999742	3	0.998970
INT	SMITH REYNOLDS	NC	LPV200	3	0.999552	3	0.999255	2	0.998630
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	1	0.999711	2	0.999626	3	0.999321
ISO	KINSTON REGL JETPORT AT STALLINGS FLD	NC	LPV	1	0.999676	2	0.999560	3	0.998870
IXA	HALIFAX-NORTHAMPTON RGNL	NC	LPV200	3	0.998900	3	0.998769	1	0.998337
JNX	JOHNSTON COUNTY	NC	LPV200	1	0.999630	2	0.999533	3	0.998862
JQF	CONCORD RGNL	NC	LPV	1	0.999722	2	0.999637	3	0.999309
LBT	LUMBERTON MUNICIPAL	NC	LPV	1	0.999811	2	0.999753	3	0.999336
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	3	0.999367	4	0.999171	3	0.998650
MEB	LAURINBURG-MAXTON	NC	LPV200	1	0.999807	2	0.999738	3	0.999340
MQI	DARE COUNTY RGNL	NC	LPV	3	0.999082	3	0.998904	2	0.998484
MRH	MICHAEL J. SMITH FIELD	NC	LPV	1	0.999730	2	0.999599	3	0.998877
MRN	FOOTHILLS RGNL	NC	LPV200	1	0.999703	2	0.999606	3	0.999055
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	3	0.999244	4	0.998954	1	0.998445
OAJ	ALBERT J ELLIS	NC	LPV200	1	0.999738	2	0.999637	3	0.998885
OCW	WARREN FIELD	NC	LPV	2	0.999529	3	0.999205	3	0.998789
ONX	CURRITUCK COUNTY RGNL	NC	LPV	2	0.998681	2	0.998603	1	0.998260
PGV	PITT-GREENVILLE	NC	LPV	2	0.999537	4	0.999356	3	0.998785
PMZ	PLYMOUTH MUNICIPAL	NC	LP	2	0.999344	3	0.999001	3	0.998661

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
RCZ	RICHMOND COUNTY	NC	LPV	1	0.999819	2	0.999745	3	0.999360
RDU	RALEIGH-DURHAM INTL	NC	LPV200	2	0.999622	4	0.999321	3	0.998758
RUQ	ROWAN COUNTY	NC	LPV200	1	0.999680	2	0.999583	3	0.999024
RWI	ROCKY MOUNT-WILSON RGNL	NC	LPV	2	0.999441	3	0.999228	3	0.998700
SOP	MOORE COUNTY	NC	LPV	1	0.999769	2	0.999668	4	0.999124
SUT	CAPE FEAR RGNL JETPORT/HOWIE FRANKLIN FLD	NC	LPV	1	0.999823	2	0.999776	4	0.999282
SVH	STATESVILLE RGNL	NC	LPV	1	0.999688	2	0.999591	3	0.999028
TDF	PERSON COUNTY	NC	LPV200	3	0.999217	3	0.999005	2	0.998472
TTA	RALEIGH EXEC AT SANFORD-LEE COUNTY	NC	LPV200	1	0.999641	2	0.999541	3	0.998900
VUJ	STANLY COUNTY	NC	LPV200	1	0.999722	2	0.999633	3	0.999286
2C8	CAVALIER MUNICIPAL	ND	LPV	1	0.997542	1	0.997504	5	0.997049
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	1	0.997701	1	0.997558	3	0.997473
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	1	0.997685	1	0.997685	4	0.997450
BIS	BISMARCK MUNICIPAL	ND	LPV200	1	0.997998	1	0.997998	3	0.997554
BWP	HARRY STERN	ND	LPV	1	0.998048	1	0.997897	3	0.997527
D09	BOTTINEAU MUNICIPAL	ND	LPV	1	0.997654	2	0.997650	4	0.997141
D55	ROBERTSON FIELD	ND	LPV	1	0.997585	1	0.997585	5	0.997041
D60	TIOGA MUNICIPAL	ND	LPV	1	0.997963	1	0.997959	4	0.997284
DIK	DICKINSON-THEODORE ROOSEVELT RGNL	ND	LPV200	1	0.998040	2	0.998025	2	0.997681
DVL	DEVILS LAKE RGNL	ND	LPV	1	0.997600	1	0.997600	5	0.997176
FAR	HECTOR INTL	ND	LPV200	1	0.997704	1	0.997550	4	0.997469
GAF	HUTSON FIELD	ND	LPV	1	0.997612	1	0.997512	5	0.997106
GFK	GRAND FORKS INTL	ND	LPV	1	0.997631	1	0.997519	6	0.997215
GWR	GWINNER-ROGER MELROE FIELD	ND	LPV200	1	0.998040	1	0.998040	3	0.997739
HZE	MERCER COUNTY RGNL	ND	LPV	1	0.998040	1	0.998040	4	0.997504
ISN	SLOULIN FLD INTL	ND	LPV200	1	0.998036	1	0.997959	3	0.997569
JMS	JAMESTOWN RGNL	ND	LPV200	1	0.997716	1	0.997716	3	0.997461
MOT	MINOT INTL	ND	LPV	1	0.997944	1	0.997813	4	0.997215
RUG	RUGBY MUNICIPAL	ND	LP	1	0.997635	1	0.997635	4	0.997203
S25	WATFORD CITY MUNICIPAL	ND	LPV	1	0.998040	1	0.998036	2	0.997620
07K	CENTRAL CITY MUNICIPAL-LARRY REINEKE FIELD	NE	LPV	3	0.999178	3	0.998924	2	0.998588
0B4	HARTINGTON MUNICIPAL	NE	LPV	1	0.998268	1	0.998160	1	0.998160
0C4	PENDER MUNICIPAL	NE	LPV	1	0.998484	1	0.998287	1	0.998175
0V3	PIONEER VILLAGE FIELD	NE	LPV	2	0.999606	2	0.999587	3	0.999093
12K	SUPERIOR MUNICIPAL	NE	LPV	2	0.999772	2	0.999772	3	0.999140
4V9	ANTELOPE COUNTY	NE	LPV	2	0.998619	2	0.998426	1	0.998164
6K3	CREIGHTON MUNICIPAL	NE	LPV	1	0.998326	1	0.998187	1	0.998156
7V7	RED CLOUD MUNICIPAL	NE	LPV	2	0.999923	2	0.999923	3	0.999147
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	1	0.998341	1	0.998187	1	0.998110
93Y	DAVID CITY MUNICIPAL	NE	LPV	3	0.998900	2	0.998657	2	0.998492
9V5	MODISETT	NE	LPV	4	0.998924	3	0.998511	1	0.998152
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	4	0.999005	4	0.998974	3	0.998750
AHQ	WAHOO MUNICIPAL	NE	LPV	3	0.998800	2	0.998592	2	0.998438
AIA	ALLIANCE MUNICIPAL	NE	LPV200	4	0.999213	4	0.999051	1	0.998183
ANW	AINSWORTH MUNICIPAL	NE	LPV200	2	0.998484	2	0.998318	1	0.998152
AUH	AURORA MUNICIPALCIPAL - AL POTTER FIELD	NE	LPV	3	0.999263	3	0.999012	2	0.998630
BBW	BROKEN BOW MUNICIPAL	NE	LPV	4	0.999348	6	0.999182	2	0.998584

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BFF	WESTERN NEB. RGNL/WILLIAM B. HEILIG FIELD	NE	LPV	4	0.999286	4	0.999271	3	0.998468
BIE	BEATRICE MUNICIPAL	NE	LPV200	3	0.999383	4	0.999263	3	0.998974
BVN	ALBION MUNICIPAL	NE	LPV	2	0.998692	2	0.998499	3	0.998434
CDR	CHADRON MUNICIPAL	NE	LPV200	4	0.998997	3	0.998600	1	0.998152
CEK	CRETE MUNICIPALCIPAL	NE	LPV	3	0.999205	4	0.999120	3	0.998846
CZD	COZAD MUNICIPAL	NE	LPV	3	0.999545	3	0.999529	3	0.998843
EAR	KEARNEY RGNL	NE	LPV200	3	0.999556	4	0.999533	3	0.998954
FBY	FAIRBURY MUNICIPAL	NE	LPV	2	0.999637	3	0.999471	3	0.999001
FET	FREMONT MUNICIPAL	NE	LPV	2	0.998630	2	0.998484	2	0.998426
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	4	0.999518	4	0.999236	2	0.998746
FNB	BRENNER FIELD	NE	LPV	3	0.999348	3	0.999313	3	0.999012
GGF	GRANT MUNICIPAL	NE	LPV	3	0.999718	3	0.999664	3	0.999082
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	4	0.999425	5	0.999263	3	0.998765
GRN	GORDON MUNICIPAL	NE	LPV	3	0.998677	3	0.998488	1	0.998152
HDE	BREWSTER FIELD	NE	LPV	2	0.999788	2	0.999718	3	0.999117
HSI	HASTINGS MUNICIPAL	NE	LPV	3	0.999549	4	0.999525	3	0.998931
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	2	0.999626	2	0.999603	3	0.999055
IML	IMPERIAL MUNICIPAL	NE	LPV	1	0.999996	2	0.999869	2	0.999379
JYR	YORK MUNICIPALCIPAL	NE	LPV	3	0.999198	3	0.998966	2	0.998615
LBF	NORTH PLATTE RGNL AIRPORT LEE BIRD FIELD	NE	LPV	3	0.999475	3	0.999429	4	0.998935
LCG	WAYNE MUNICIPAL	NE	LPV	1	0.998480	1	0.998283	1	0.998171
LNK	LINCOLN	NE	LPV	3	0.999008	3	0.998839	2	0.998522
LXN	JIM KELLY FIELD	NE	LPV	3	0.999603	3	0.999583	3	0.998870
MCK	MCCOOK RGNL	NE	LPV	1	0.999961	1	0.999961	2	0.999394
MLE	MILLARD	NE	LPV	3	0.998750	2	0.998569	1	0.998314
ODX	EVELYN SHARP FIELD	NE	LPV	3	0.998981	2	0.998557	2	0.998526
OFK	KARL STEFAN MEMORIAL	NE	LPV	2	0.998611	2	0.998426	1	0.998171
OGA	SEARLE FIELD	NE	LPV	3	0.999533	3	0.999506	3	0.998985
OKS	GARDEN COUNTY	NE	LPV	3	0.999576	3	0.999552	3	0.998769
OLU	COLUMBUS MUNICIPAL	NE	LPV	3	0.998796	2	0.998511	2	0.998445
OMA	EPPLEY AIRFIELD	NE	LPV	2	0.998619	2	0.998561	1	0.998314
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER FIELD	NE	LPV	1	0.998353	1	0.998187	1	0.998148
PMV	PLATTSMOUTH MUNICIPAL	NE	LPV	3	0.998800	2	0.998642	2	0.998492
RBE	ROCK COUNTY	NE	LPV	1	0.998345	1	0.998187	1	0.998152
SNY	SIDNEY MUNICIPAL/LLOYD W. CARR FIELD	NE	LPV	2	0.999637	2	0.999606	3	0.999063
SWT	SEWARD MUNICIPALCIPAL	NE	LPV	3	0.999066	3	0.998951	2	0.998600
TIF	THOMAS COUNTY	NE	LPV	4	0.999093	3	0.998665	1	0.998187
VTN	MILLER FIELD	NE	LPV	1	0.998268	1	0.998187	1	0.998152
ASH	BOIRE FLD	NH	LPV	1	0.997913	1	0.997913	5	0.997176
CNH	CLAREMONT MUNICIPAL	NH	LP	1	0.997932	2	0.997921	5	0.997068
CON	CONCORD MUNICIPAL	NH	LPV	1	0.997913	1	0.997913	5	0.997068
DAW	SKYHAVEN	NH	LPV	1	0.997855	1	0.997855	6	0.997060
EEN	DILLANT-HOPKINS	NH	LPV	2	0.998094	2	0.997928	5	0.997160
HIE	MOUNT WASHINGTON RGNL	NH	LPV	1	0.997793	1	0.997755	5	0.996979
LCI	LACONIA MUNICIPAL	NH	LPV	1	0.997847	1	0.997847	5	0.997041
LEB	LEBANON MUNICIPAL	NH	LPV	1	0.997928	2	0.997917	5	0.997060
MHT	MANCHESTER	NH	LPV200	1	0.997913	1	0.997913	6	0.997095
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	1	0.997897	1	0.997897	6	0.997064
39N	PRINCETON	NJ	LPV	1	0.998260	1	0.998225	2	0.997924
47N	CENTRAL JERSEY RGNL	NJ	LP	1	0.998260	1	0.998225	2	0.997913

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
4N1	GREENWOOD LAKE	NJ	LP	1	0.998256	1	0.998221	4	0.997913
ACY	ATLANTIC CITY INTL	NJ	LPV200	1	0.998299	1	0.998256	1	0.998183
CDW	ESSEX COUNTY	NJ	LPV	1	0.998256	1	0.998221	3	0.997816
EWR	NEWARK LIBERTY INTL	NJ	LPV	1	0.998260	1	0.998221	3	0.997824
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	1	0.998302	1	0.998256	1	0.998183
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	1	0.998256	1	0.998221	3	0.997840
N14	FLYING W	NJ	LPV	1	0.998299	1	0.998256	2	0.998067
N40	SKY MANOR	NJ	LP	1	0.998260	1	0.998221	2	0.997967
TEB	TETERBORO	NJ	LPV	1	0.998256	1	0.998221	3	0.997805
TTN	TRENTON MERCER	NJ	LPV200	1	0.998260	1	0.998225	2	0.997982
VAY	SOUTH JERSEY RGNL	NJ	LP	1	0.998299	1	0.998245	2	0.998067
WWD	CAPE MAY COUNTY	NJ	LPV	1	0.998368	1	0.998256	1	0.998187
CYDF	DEER LAKE	NL	LPV	3	0.996408	9	0.995849	222	0.974441
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV	0	1	0	1	0	1
CNM	CAVERN CITY AIR TRML	NM	LP	0	1	0	1	1	0.999996
CVN	CLOVIS MUNICIPAL	NM	LPV	0	1	0	1	0	1
DMN	DEMING MUNICIPAL	NM	LPV	0	1	0	1	1	0.999969
FMN	FOUR CORNERS RGNL	NM	LPV200	0	1	0	1	0	1
HOB	LEA COUNTY RGNL	NM	LPV200	0	1	0	1	0	1
LAM	LOS ALAMOS	NM	LP	0	1	0	1	0	1
ONM	SOCORRO MUNICIPAL	NM	LP	0	1	0	1	1	0.999996
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	1	0	1	0	1
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	1	0	1	1	0.999996
SVC	GRANT COUNTY	NM	LPV	0	1	0	1	2	0.999965
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	1	0.997280	2	0.997211	9	0.995922
CYEV	INUVIK	NT	LPV	5	0.995467	9	0.994641	57	0.989873
ELY	ELY ARPT-YELLAND FLD	NV	LPV	0	1	0	1	2	0.999896
LAS	MC CARRAN INTL	NV	LPV	0	1	0	1	2	0.999765
RNO	RENO/TAHOE INTL	NV	LPV	0	1	1	0.999996	23	0.999252
RTS	RENO/STEAD	NV	LPV	0	1	0	1	27	0.999236
TPH	TONOPAH	NV	LP	0	1	0	1	2	0.999761
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	1	0	1	5	0.999676
06N	RANDALL	NY	LP	1	0.998256	1	0.998221	4	0.997894
1B1	COLUMBIA COUNTY	NY	LPV	1	0.998256	3	0.998198	5	0.997438
44N	SKY ACRES	NY	LPV	1	0.998256	2	0.998206	3	0.997639
4B6	TICONDEROGA MUNICIPAL	NY	LPV	1	0.997932	2	0.997901	5	0.997049
5B2	SARATOGA COUNTY	NY	LPV	2	0.998152	2	0.997959	5	0.997184
5G0	LE ROY	NY	LP	1	0.998260	1	0.998218	2	0.997801
7G0	LEDGEDALE AIRPARK	NY	LPV	1	0.998260	1	0.998214	2	0.997797
9G0	BUFFALO AIRFIELD	NY	LP	1	0.998260	1	0.998218	2	0.997847
ALB	ALBANY INTL	NY	LPV200	2	0.998191	3	0.998129	6	0.997415
ART	WATERTOWN INTL	NY	LPV200	1	0.998025	2	0.997963	4	0.997612
BGM	GREATER BINGHAMTON/EDWIN A LINK FIELD	NY	LPV200	1	0.998241	1	0.998221	3	0.997955
BUF	BUFFALO NIAGARA INTL	NY	LPV200	1	0.998260	1	0.998218	2	0.997847
D38	CANANDAIGUA	NY	LP	1	0.998256	1	0.998221	2	0.997778
ELM	ELMIRA/CORNING RGNL	NY	LPV200	1	0.998237	1	0.998221	2	0.997840
ELZ	WELLSVILLE MUNICIPAL ARPT	NY	LPV	1	0.998260	1	0.998237	2	0.997913
FOK	FRANCIS S. GABRESKI	NY	LPV200	1	0.998256	1	0.998221	5	0.997743
FRG	REPUBLIC	NY	LPV200	1	0.998256	1	0.998221	3	0.997816
FZY	OSWEGO COUNTY	NY	LPV	1	0.998221	2	0.998171	3	0.997874
GFL	FLOYD BENNETT MEMORIAL	NY	LPV	2	0.998086	2	0.997948	5	0.997068
GVQ	BATAVIA	NY	LPV200	1	0.998260	1	0.998218	2	0.997809
HPN	WESTCHESTER COUNTY	NY	LPV	1	0.998256	1	0.998221	3	0.997789

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
HTF	HORNELL MUNICIPAL	NY	LPV	1	0.998260	1	0.998233	2	0.997847
HTO	EAST HAMPTON	NY	LPV	1	0.998287	1	0.998221	6	0.997604
HWV	BROOKHAVEN	NY	LPV	1	0.998256	1	0.998221	5	0.997793
IAG	NIAGARA FALLS INTL	NY	LPV	1	0.998260	1	0.998194	2	0.997847
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	1	0.998256	1	0.998221	4	0.997813
ITH	ITHACA TOMPKINS RGNL	NY	LPV	1	0.998233	1	0.998221	3	0.997951
JFK	JOHN F KENNEDY INTL	NY	LPV	1	0.998256	1	0.998221	3	0.997820
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	1	0.998260	1	0.998233	2	0.997948
K09	PISECO	NY	LP	2	0.998110	2	0.997959	5	0.997211
LGA	LA GUARDIA	NY	LPV200	1	0.998256	1	0.998221	3	0.997809
MAL	MALONE-DUFORT	NY	LPV	1	0.997778	2	0.997755	6	0.997180
MGJ	ORANGE COUNTY	NY	LPV	1	0.998256	1	0.998221	4	0.997897
MSS	MASSENA INTL-RICHARDS FIELD	NY	LPV	1	0.997778	2	0.997747	6	0.997249
MSV	SULLIVAN COUNTY INTL	NY	LPV	1	0.998256	1	0.998221	4	0.997924
N66	ONEONTA MUNICIPAL	NY	LPV	1	0.998256	2	0.998194	4	0.997747
NY0	FULTON COUNTY	NY	LPV	2	0.998187	3	0.998106	5	0.997481
OGS	OGDENSBURG INTL	NY	LPV	1	0.997975	2	0.997940	5	0.997411
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	1	0.998260	1	0.998233	2	0.997917
PBG	PLATTSBURGH INTL	NY	LPV	1	0.997785	2	0.997774	6	0.997168
PEO	PENN YAN	NY	LPV	1	0.998225	1	0.998225	3	0.997959
POU	DUTCHESS COUNTY	NY	LPV	1	0.998256	2	0.998218	3	0.997639
RME	GRIFFISS INTL	NY	LPV200	2	0.998179	3	0.998113	5	0.997751
ROC	GREATER ROCHESTER INTL	NY	LPV200	1	0.998260	1	0.998214	2	0.997789
SCH	SCHENECTADY COUNTY	NY	LPV200	2	0.998179	3	0.998113	6	0.997415
SDC	WILLIAMSON-SODUS	NY	LPV	1	0.998221	2	0.998183	2	0.997770
SLK	ADIRONDACK RGNL	NY	LPV200	1	0.997859	2	0.997809	6	0.997180
SWF	STEWART INTL	NY	LPV200	1	0.998256	1	0.998221	3	0.997755
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	2	0.998218	3	0.998179	4	0.997859
VGC	HAMILTON MUNICIPAL	NY	LPV	2	0.998221	3	0.998187	4	0.997836
0G6	WILLIAMS COUNTY	OH	LPV	1	0.998337	1	0.998268	1	0.998233
16G	SENECA COUNTY	OH	LPV	1	0.998337	1	0.998299	1	0.998248
1G0	WOOD COUNTY	OH	LPV	1	0.998333	1	0.998264	1	0.998221
1G3	KENT STATE UNIV	OH	LPV	1	0.998337	1	0.998252	1	0.998214
4I3	KNOX COUNTY	OH	LPV200	1	0.998445	1	0.998302	1	0.998268
6G5	BARNESVILLE-BRADFIELD	OH	LP	1	0.998445	1	0.998318	1	0.998279
AOH	LIMA ALLEN COUNTY	OH	LPV200	1	0.998337	1	0.998314	1	0.998252
AXV	NEIL ARMSTRONG	OH	LPV	1	0.998449	1	0.998333	1	0.998264
BJJ	WAYNE COUNTY	OH	LPV	1	0.998337	1	0.998279	1	0.998256
BKL	BROOKHAVEN	OH	LPV	1	0.998302	1	0.998241	1	0.998202
CAK	AKRON-CANTON RGNL	OH	LPV200	1	0.998337	1	0.998260	1	0.998229
CGF	CUYAHOGA COUNTY	OH	LPV	1	0.998302	1	0.998241	1	0.998202
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	1	0.998337	1	0.998245	1	0.998206
CMH	PORT COLUMBUS INTL	OH	LPV200	1	0.998449	1	0.998337	1	0.998275
CQA	LAKEFIELD	OH	LPV	1	0.998449	1	0.998337	1	0.998272
CXY	CAPITAL CITY	OH	LPV	1	0.998299	1	0.998256	1	0.998183
DAY	JAMES M COX DAYTON INTL	OH	LPV200	2	0.998573	1	0.998337	1	0.998283
DLZ	DELAWARE MUNICIPAL	OH	LPV	1	0.998445	1	0.998333	1	0.998268
EDJ	BELLEFONTAINE RGNL	OH	LPV	1	0.998449	1	0.998333	1	0.998264
FDY	FINDLAY	OH	LPV	1	0.998337	1	0.998306	1	0.998248
FZI	FOSTORIA METROPOLITAN	OH	LPV	1	0.998337	1	0.998279	1	0.998245
GQQ	GALION MUNICIPAL	OH	LP	1	0.998337	1	0.998333	1	0.998256
HAO	BUTLER CO RGNL	OH	LPV	2	0.998650	1	0.998449	1	0.998306

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
HZY	ASHTABULA COUNTY	OH	LPV	1	0.998299	1	0.998241	1	0.998183
I19	GREENE COUNTY-LEWIS A JACKSON RGNL	OH	LPV	2	0.998596	1	0.998337	1	0.998287
I66	CLINTON FIELD	OH	LPV	2	0.998615	1	0.998410	1	0.998291
I68	LEBANON-WARREN COUNTY	OH	LPV	2	0.998627	1	0.998445	1	0.998299
I69	CLERMONT COUNTY	OH	LP	2	0.998681	1	0.998449	1	0.998314
I74	GRIMES FIELD	OH	LPV	1	0.998449	1	0.998337	1	0.998268
ILN	AIRBORNE AIRPARK	OH	LPV200	2	0.998623	1	0.998410	1	0.998291
LCK	RICKENBACKER INTL	OH	LPV200	2	0.998573	1	0.998337	1	0.998279
LHQ	FAIRFIELD COUNTY	OH	LPV200	2	0.998573	1	0.998337	1	0.998283
LNN	WILLOUGHBY	OH	LPV	1	0.998299	1	0.998241	1	0.998202
LPR	LORAIN COUNTY RGNL	OH	LPV200	1	0.998337	1	0.998245	1	0.998206
LUK	CINCINNATI MUNICIPAL AIRPORT-LUNKEN FIELD	OH	LPV	2	0.998688	1	0.998449	1	0.998314
MFD	MANSFIELD LAHM RGNL	OH	LPV200	1	0.998337	1	0.998295	1	0.998256
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	2	0.998611	1	0.998410	1	0.998295
MNN	MARION MUNICIPAL	OH	LPV	1	0.998337	1	0.998333	1	0.998260
MRT	UNION COUNTY	OH	LP	1	0.998449	1	0.998337	1	0.998268
MWO	MIDDLETOWN REGIONAL/HOOK FIELD	OH	LPV	2	0.998623	1	0.998410	1	0.998302
OSU	OHIO STATE UNIVERSITY	OH	LPV200	1	0.998449	1	0.998337	1	0.998272
OWX	PUTNAM COUNTY	OH	LPV	1	0.998337	1	0.998299	1	0.998245
OXD	MIAMI UNIVERSITY	OH	LPV	2	0.998681	1	0.998445	1	0.998306
PCW	CARL R KELLER FIELD	OH	LPV	1	0.998333	1	0.998291	1	0.998206
PHD	HARRY CLEVER FIELD	OH	LP	1	0.998380	1	0.998302	1	0.998268
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	2	0.998673	1	0.998445	1	0.998302
RZT	ROSS COUNTY	OH	LPV	2	0.998607	1	0.998337	1	0.998287
S24	SANDUSKY COUNTY RGNL	OH	LPV	1	0.998333	1	0.998299	1	0.998218
SGH	SPRINGFIELD-BECKLEY MUNICIPAL	OH	LPV200	2	0.998573	1	0.998337	1	0.998279
TDZ	TOLEDO EXECUTIVE	OH	LP	1	0.998333	1	0.998264	1	0.998218
TOL	TOLEDO EXPRESS	OH	LPV200	1	0.998333	1	0.998264	1	0.998221
TSO	CARROLL COUNTY-TOLSON	OH	LP	1	0.998376	1	0.998275	1	0.998268
TZR	BOLTON FIELD	OH	LPV200	1	0.998449	1	0.998337	1	0.998275
UNI	OHIO UNIVERSITY SNYDER FIELD	OH	LPV200	2	0.998623	1	0.998410	1	0.998299
USE	FULTON COUNTY	OH	LPV	1	0.998333	1	0.998264	1	0.998229
UYF	MADISON COUNTY	OH	LPV	1	0.998449	1	0.998337	1	0.998275
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	1	0.998333	1	0.998252	1	0.998183
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	1	0	1	0	1
80F	ANTLERS MUNICIPAL	OK	LPV	0	1	0	1	1	0.999996
ADH	ADA MUNICIPAL	OK	LPV	0	1	0	1	0	1
ADM	ARDMORE MUNICIPAL	OK	LPV200	0	1	0	1	0	1
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	0	1	0	1	0	1
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	0	1	0	1	1	0.999977
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	1	0	1	1	0.999958
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	1	0	1	0	1
CLK	CLINTON RGNL	OK	LPV200	0	1	0	1	0	1
CSM	CLINTON-SHERMAN	OK	LPV200	0	1	0	1	0	1
DUA	EAKER FIELD	OK	LPV	0	1	0	1	0	1
DUC	HALLIBURTON FIELD	OK	LPV	0	1	0	1	0	1
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
F22	PERRY MUNICIPAL	OK	LPV	0	1	0	1	1	0.999981
FDR	FREDERICK RGNL	OK	LPV200	0	1	0	1	0	1
GCM	CLAREMORE RGNL	OK	LPV	0	1	0	1	1	0.999969
GMJ	GROVE MUNICIPAL	OK	LPV	0	1	0	1	1	0.999981
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	1	0	1	1	0.999996
GUY	GUYMON MUNICIPAL	OK	LPV	0	1	0	1	0	1
GZL	STIGLER RGNL	OK	LPV	0	1	0	1	2	0.999985
HBR	HOBART MUNICIPAL	OK	LPV	0	1	0	1	0	1
HSD	SUNDANCE AIRPARK	OK	LPV	0	1	0	1	0	1
MKO	DAVIS FIELD	OK	LPV	0	1	0	1	1	0.999981
MLC	MC ALESTER RGNL	OK	LPV	0	1	0	1	0	1
OKC	WILL ROGERS WORLD	OK	LPV200	0	1	0	1	0	1
OKM	OKMULGEE RGNL	OK	LPV	0	1	0	1	0	1
OUN	UNIVERSITY OF OKLAHOMA WESTHEIMER	OK	LPV200	0	1	0	1	0	1
OWP	WILLIAM R. POGUE MUNICIPAL	OK	LPV	0	1	0	1	1	0.999996
PNC	PONCA CITY RGNL	OK	LPV	0	1	0	1	1	0.999981
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	1	0	1	0	1
PWA	WILEY POST	OK	LPV200	0	1	0	1	0	1
RCE	CLARENCE E. PAGE MUNICIPAL	OK	LPV	0	1	0	1	0	1
RVS	RICHARD LLOYD JONES JR	OK	LPV	0	1	0	1	1	0.999996
SNL	SHAWNEE RGNL	OK	LPV200	0	1	0	1	1	0.999996
SWO	STILLWATER RGNL	OK	LPV	0	1	0	1	1	0.999985
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	1	0	1	1	0.999981
TUL	TULSA INTL	OK	LPV200	0	1	0	1	1	0.999985
WDG	ENID WOODRING RGNL	OK	LPV200	0	1	0	1	1	0.999996
WWR	WEST WOODWARD	OK	LPV	0	1	0	1	0	1
CNS7	KINCARDINE	ON	LPV	1	0.998260	1	0.998144	3	0.997758
CYHD	DRYDEN REGIONAL	ON	LPV	1	0.997338	3	0.997257	6	0.996478
CYKF	KITCHENER / WATERLOO	ON	LPV	1	0.998299	1	0.998164	2	0.997894
CYOW	OTTAWA / MACDONALDCARTIER INTL	ON	LPV	1	0.997758	2	0.997658	3	0.997311
CYQT	THUNDER BAY	ON	LPV	1	0.997338	2	0.997296	6	0.996794
CYTS	TIMMINS / VICTOR M POWER	ON	LPV	1	0.997265	2	0.997195	5	0.996933
CYXL	SIOUX LOOKOUT	ON	LPV	1	0.997311	3	0.997203	7	0.996404
AST	ASTORIA RGNL	OR	LPV	3	0.998800	2	0.998410	16	0.997242
BDN	BEND MUNICIPAL	OR	LPV	0	1	1	0.999965	8	0.998426
CVO	CORVALLIS MUNICIPAL	OR	LPV200	3	0.999641	4	0.999591	13	0.997897
EUG	MAHLON SWEET FIELD	OR	LPV200	3	0.999796	3	0.999796	15	0.997990
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	1	0.999888	2	0.999753	5	0.998387
HIO	PORTLAND-HILLSBORO	OR	LPV200	3	0.998974	3	0.998715	11	0.997959
LGD	LA GRANDE/UNION COUNTY	OR	LPV	4	0.999008	4	0.998897	3	0.998140
LMT	KLAMATH FALLS	OR	LPV	0	1	0	1	10	0.999070
MMV	MCMINNVILLE MUNICIPAL	OR	LPV	3	0.999047	4	0.998893	13	0.997971
ONO	ONTARIO MUNICIPAL	OR	LPV	1	0.999850	1	0.999850	7	0.999074
PDT	EASTERN OREGON RGNL AT PENDLETON	OR	LPV200	3	0.998719	2	0.998499	4	0.998056
PDX	PORTLAND INTL	OR	LPV200	3	0.998958	4	0.998831	11	0.997843
RDM	ROBERTS FIELD	OR	LPV200	0	1	1	0.999961	8	0.998360
S33	MADRAS MUNICIPALCIPAL	OR	LPV	3	0.999626	4	0.999556	6	0.998183
SLE	MCNARY FLD	OR	LPV200	3	0.999394	4	0.999290	12	0.998117
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	3	0.998931	3	0.998650	11	0.997712

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
UAO	AURORA STATE	OR	LPV	3	0.999043	3	0.998927	12	0.998094
22N	JAKE ARNER MEMORIAL	PA	LP	1	0.998260	1	0.998225	2	0.998160
2G9	SOMERSET COUNTY	PA	LPV	1	0.998430	1	0.998318	1	0.998221
8G2	CORRY-LAWRENCE	PA	LPV	1	0.998279	1	0.998237	3	0.998144
8N8	DANVILLE	PA	LP	1	0.998260	1	0.998221	2	0.998171
9D4	DECK	PA	LPV	1	0.998299	1	0.998256	1	0.998183
ABE	LEHIGH VALLEY INTL	PA	LPV	1	0.998260	1	0.998221	2	0.998164
AFJ	WASHINGTON COUNTY	PA	LPV200	1	0.998445	1	0.998314	1	0.998279
AGC	ALLEGHENY COUNTY	PA	LPV200	1	0.998376	1	0.998287	1	0.998221
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	1	0.998302	1	0.998283	1	0.998183
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV	1	0.998256	1	0.998221	2	0.997924
AXQ	CLARION COUNTY	PA	LPV	1	0.998295	1	0.998256	1	0.998183
BFD	BRADFORD RGNL	PA	LPV200	1	0.998260	1	0.998245	3	0.998121
BTP	BUTLER COUNTY/K W SCHOLTER FLD	PA	LPV	1	0.998337	1	0.998268	1	0.998191
BVI	BEAVER FALLS MUNICIPAL	PA	LPV	1	0.998337	1	0.998268	1	0.998194
DUJ	DUBOIS RGNL	PA	LPV200	1	0.998295	1	0.998256	1	0.998183
ERI	ERIE INTL/TOM RIDGE FIELD	PA	LPV	1	0.998299	1	0.998233	3	0.998102
FIG	CLEARFIELD-LAWRENCE	PA	LPV	1	0.998299	1	0.998260	1	0.998183
FKL	VENANGO RGNL	PA	LPV	1	0.998299	1	0.998252	1	0.998183
FWQ	ROSTRAVER	PA	LPV	1	0.998445	1	0.998302	1	0.998221
GKJ	PORT MEADVILLE	PA	LP	1	0.998299	1	0.998245	1	0.998183
HMZ	BEDFORD COUNTY	PA	LPV	1	0.998407	1	0.998295	1	0.998221
HZL	HAZLETON MUNICIPAL	PA	LPV	1	0.998260	1	0.998221	2	0.998156
IPT	WILLIAMSPORT RGNL	PA	LPV	1	0.998256	1	0.998221	2	0.998164
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA COUNTY	PA	LPV200	1	0.998318	1	0.998295	1	0.998214
LBE	ARNOLD PALMER RGNL	PA	LPV	1	0.998356	1	0.998299	1	0.998221
LNS	LANCASTER	PA	LPV	1	0.998299	1	0.998256	1	0.998183
LOM	WINGS FIELD	PA	LPV	1	0.998264	1	0.998225	2	0.998179
MDT	HARRISBURG INTL	PA	LPV	1	0.998299	1	0.998256	1	0.998183
MPO	POCONO MOUNTAINS MUNICIPAL	PA	LPV	1	0.998260	1	0.998221	2	0.997936
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	1	0.998299	1	0.998245	1	0.998183
N38	WELLSBORO JOHNSTON	PA	LP	1	0.998283	1	0.998248	3	0.998083
N79	NORTHUMBERLAND COUNTY	PA	LPV	1	0.998260	1	0.998225	2	0.998175
OYM	ST MARYS MUNICIPAL	PA	LPV	1	0.998295	1	0.998252	2	0.998179
PHL	PHILADELPHIA INTL	PA	LPV	1	0.998299	1	0.998241	1	0.998183
PIT	PITTSBURGH INTL	PA	LPV200	1	0.998337	1	0.998275	1	0.998221
PNE	NORTHEAST PHILADELPHIA	PA	LPV	1	0.998260	1	0.998233	2	0.998175
PSB	MID STATE	PA	LPV	1	0.998299	1	0.998260	1	0.998183
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	1	0.998299	1	0.998237	2	0.998179
RVL	MIFFLIN COUNTY	PA	LPV	1	0.998260	1	0.998225	1	0.998183
THV	YORK	PA	LP	1	0.998299	1	0.998256	1	0.998183
UCP	NEW CASTLE MUNICIPAL	PA	LPV	1	0.998337	1	0.998256	1	0.998183
UKT	QUAKERTOWN	PA	LP	1	0.998260	1	0.998225	2	0.998167
UNV	UNIVERSITY PARK	PA	LPV200	1	0.998299	1	0.998260	1	0.998183
VVS	JOSEPH A. HARDY CONNELLSVILLE	PA	LPV200	1	0.998445	1	0.998318	1	0.998221
WAY	GREENE COUNTY	PA	LPV	1	0.998445	1	0.998326	1	0.998287
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	1	0.998256	1	0.998221	2	0.997928

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
XLL	ALLENTOWN-QUEEN CITY MUNICIPAL	PA	LP	1	0.998260	1	0.998221	2	0.998164
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	1	0.998268	1	0.998225	2	0.998175
CPN8	OPINACA	QC	LPV	3	0.997160	5	0.996570	13	0.993981
CSR3	VICTORIAVILLE	QC	LPV	2	0.997512	2	0.997434	7	0.996740
CTP9	KATTINIQ / DONALDSON	QC	LPV	21	0.991223	31	0.988495	218	0.945934
CYEY	AMOS	QC	LPV	1	0.997296	2	0.997164	4	0.996736
CYHU	MONTREAL / STHUBERT	QC	LPV	2	0.997693	3	0.997654	6	0.997106
CYIF	STAUGUSTIN	QC	LPV	4	0.996501	10	0.995529	120	0.983592
CYMX	MONTREAL (MIRABEL INTL)	QC	LPV	2	0.997693	3	0.997639	6	0.996960
CYQB	QUEBEC / JEAN LESAGE INTL	QC	LPV	2	0.997477	2	0.997377	8	0.996547
CYRI	RIVIEREDULOUP	QC	LPV	1	0.997218	1	0.997188	7	0.995999
CYRQ	TROISRIVIERES	QC	LPV	1	0.997377	2	0.997296	7	0.996732
CYVB	BONAVENTURE	QC	LPV	1	0.997045	2	0.996952	9	0.995891
CYVP	KUUJJUAQ	QC	LPV	10	0.994012	25	0.992072	138	0.972816
CYYY	MONTJOLI	QC	LPV	1	0.997041	2	0.996925	8	0.995910
BID	BLOCK ISLAND STATE	RI	LPV	1	0.998256	2	0.998210	5	0.997238
OQU	QUONSET STATE	RI	LPV	1	0.998256	2	0.998156	5	0.997222
PVD	THEODORE FRANCIS GREEN STATE	RI	LPV200	2	0.998245	2	0.998156	5	0.997215
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	0	1	0	1	2	0.999811
AIK	AIKEN MUNICIPAL	SC	LPV200	0	1	0	1	2	0.999861
AND	ANDERSON RGNL	SC	LPV200	0	1	1	0.999973	2	0.999568
ARW	BEAUFORT COUNTY	SC	LPV200	0	1	0	1	1	0.999915
BBP	MARLBORO COUNTY JETPORT-H E AVENT FIELD	SC	LPV	1	0.999823	2	0.999765	3	0.999379
BNL	BARNWELL RGNL	SC	LPV	0	1	0	1	2	0.999900
CAE	COLUMBIA METROPOLITAN	SC	LPV200	0	1	0	1	2	0.999796
CDN	WOODWARD FIELD	SC	LPV	0	1	2	0.999919	2	0.999533
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	1	1	0.999965	2	0.999564
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	1	1	0.999985	1	0.999880
CRE	GRAND STRAND	SC	LPV200	1	0.999969	2	0.999934	3	0.999402
DCM	CHESTER CATAWBA RGNL	SC	LPV	1	0.999981	2	0.999880	3	0.999464
DYB	SUMMERVILLE	SC	LPV200	0	1	1	0.999992	2	0.999888
FDW	FAIRFIELD COUNTY	SC	LPV	0	1	1	0.999969	2	0.999545
FLO	FLORENCE RGNL	SC	LPV	1	0.999927	2	0.999888	3	0.999425
GGE	GEORGETOWN COUNTY	SC	LPV200	0	1	1	0.999958	2	0.999695
GMU	GREENVILLE DOWNTOWN	SC	LPV200	1	0.999996	2	0.999811	2	0.999545
GSP	GREENVILLE-SPARTANBURG INTL - ROGER MILLIKEN	SC	LPV200	1	0.999996	2	0.999792	2	0.999518
GYH	DONALDSON CENTER	SC	LPV	0	1	1	0.999950	2	0.999549
HYW	CONWAY-HORRY COUNTY	SC	LPV	1	0.999981	2	0.999950	3	0.999421
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	1	1	0.999988	1	0.999880
LKR	LANCASTER COUNTY-MC WHIRTER FIELD	SC	LPV200	1	0.999931	2	0.999865	3	0.999452
LQK	PICKENS COUNTY	SC	LPV	0	1	1	0.999950	2	0.999556
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	1	1	0.999977	1	0.999880
MKS	BERKELEY COUNTY	SC	LPV	0	1	1	0.999981	2	0.999830
MYR	MYRTLE BEACH INTL	SC	LPV200	1	0.999977	1	0.999950	3	0.999425
OGB	ORANGEBURG MUNICIPAL	SC	LPV200	0	1	0	1	2	0.999815
RBW	LOWCOUNTRY RGNL	SC	LPV200	0	1	0	1	1	0.999915
SMS	SUMTER	SC	LPV200	0	1	2	0.999973	2	0.999579

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SC	LPV200	1	0.999934	2	0.999757	2	0.999495
UDG	DARLINGTON COUNTY JETPORT	SC	LPV	1	0.999880	2	0.999834	3	0.999406
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	1	0.999823	2	0.999753	3	0.999433
0D8	GETTYSBURG MUNICIPAL	SD	LPV200	1	0.998152	1	0.998152	2	0.998017
49B	STURGIS MUNICIPAL	SD	LPV	1	0.998198	1	0.998183	2	0.998121
9D1	GREGORY MUNICIPAL - FLYNN FIELD	SD	LPV	1	0.998225	1	0.998187	1	0.998090
ABR	ABERDEEN RGNL	SD	LPV200	1	0.998052	1	0.998052	2	0.997863
ATY	WATERTOWN RGNL	SD	LPV200	1	0.998075	1	0.998075	2	0.997878
BKX	BROOKINGS RGNL	SD	LPV	1	0.998125	1	0.998125	2	0.997882
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	1	0.998156	1	0.998152	2	0.998113
FSD	JOE FOSS FIELD	SD	LPV200	1	0.998140	1	0.998140	2	0.997894
HON	HURON RGNL	SD	LPV200	1	0.998129	1	0.998110	2	0.997882
HSR	HOT SPRINGS MUNICIPAL	SD	LP	3	0.998646	2	0.998410	2	0.998144
ICR	WINNER RGNL	SD	LPV	1	0.998225	2	0.998183	2	0.998148
MBG	MOBRIDGE MUNICIPAL	SD	LPV	1	0.998152	1	0.998152	2	0.997982
MDS	MADISON MUNICIPAL	SD	LPV	1	0.998129	1	0.998129	2	0.997886
MHE	MITCHELL MUNICIPAL	SD	LPV	1	0.998156	1	0.998125	2	0.997894
MKA	MILLER MUNICIPAL	SD	LPV200	1	0.998140	1	0.998140	2	0.998048
PIR	PIERRE RGNL	SD	LPV	1	0.998221	2	0.998179	2	0.998079
RAP	RAPID CITY RGNL	SD	LPV200	1	0.998221	1	0.998183	2	0.998125
SPF	BLACK HILLS-CLYDE ICE FIELD	SD	LPV	1	0.998202	1	0.998183	2	0.998117
VMR	HAROLD DAVIDSON FIELD	SD	LPV	1	0.998229	1	0.998160	1	0.997951
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	1	0.998225	1	0.998152	2	0.998094
CKQ8	MCARTHUR RIVER	SK	LPV	4	0.996127	5	0.995999	27	0.993383
CYKJ	KEY LAKE	SK	LPV	5	0.996563	4	0.996123	29	0.993931
0A3	SMITHVILLE MUNICIPAL	TN	LP	1	0.999803	1	0.999799	5	0.999414
0M3	JOHN A BAKER	TN	LP	1	0.999931	1	0.999904	2	0.999811
0M4	BENTON COUNTY	TN	LPV	1	0.999942	1	0.999857	5	0.999614
0M5	HUMPHREYS COUNTY	TN	LP	1	0.999880	1	0.999842	5	0.999487
1A3	MARTIN CAMPBELL FIELD	TN	LP	1	0.999838	2	0.999784	2	0.999603
1M5	PORTLAND MUNICIPAL	TN	LPV	3	0.999645	2	0.999502	2	0.998715
2A0	MARK ANTON	TN	LPV	1	0.999784	2	0.999761	2	0.999610
2M8	CHARLES W. BAKER	TN	LPV	0	1	0	1	2	0.999969
3M7	LAFAYETTE MUNICIPAL	TN	LPV	3	0.999668	3	0.999633	2	0.998711
BGF	WINCHESTER MUNICIPAL	TN	LPV	1	0.999888	1	0.999888	2	0.999668
BNA	NASHVILLE INTL	TN	LPV200	1	0.999823	1	0.999815	5	0.999375
CHA	LOVELL FIELD	TN	LPV200	1	0.999869	1	0.999869	2	0.999633
CKV	OUTLAW FIELD	TN	LPV	3	0.999657	2	0.999518	3	0.998912
CSV	CROSSVILLE MEMORIAL-WHITSON FIELD	TN	LPV200	1	0.999792	2	0.999734	5	0.999375
DKX	KNOXVILLE DOWNTOWN ISLAND	TN	LPV	1	0.999757	2	0.999664	3	0.999032
DYR	DYERSBURG RGNL	TN	LPV	0	1	1	0.999958	5	0.999668
FYE	FAYETTE CO	TN	LPV	0	1	0	1	2	0.999938
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	1	0.999900	1	0.999900	2	0.999711
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	1	0.999749	2	0.999664	3	0.999113
GZS	ABERNATHY FIELD	TN	LPV	1	0.999915	1	0.999915	2	0.999761
HZD	CARROLL COUNTY	TN	LPV	1	0.999950	1	0.999865	5	0.999579
JWN	JOHN C. TUNE	TN	LPV	1	0.999830	1	0.999823	5	0.999367
LUG	ELLINGTON	TN	LPV	1	0.999857	1	0.999857	2	0.999715

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
M01	GENERAL DEWITT SPAIN	TN	LPV	0	1	0	1	1	0.999973
M33	SUMNER COUNTY RGNL	TN	LP	2	0.999769	2	0.999757	3	0.998912
M54	LEBANON MUNICIPAL	TN	LPV	2	0.999807	2	0.999803	3	0.999043
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	3	0.999688	3	0.999660	3	0.998866
MBT	MURFREESBORO MUNICIPAL	TN	LPV	1	0.999815	1	0.999815	4	0.999506
MEM	MEMPHIS INTL	TN	LPV200	0	1	0	1	1	0.999973
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	1	1	0.999958	2	0.999877
MMI	MCMINN COUNTY	TN	LPV	1	0.999776	2	0.999734	2	0.999595
MOR	MOORE-MURRELL	TN	LPV	1	0.999738	2	0.999637	3	0.998916
MQY	SMYRNA	TN	LPV	1	0.999819	1	0.999811	5	0.999441
MRC	MAURY COUNTY	TN	LPV	1	0.999877	1	0.999877	2	0.999757
NQA	MILLINGTON RGNL JETPORT	TN	LPV	0	1	0	1	2	0.999958
PHT	HENRY COUNTY	TN	LPV200	1	0.999942	1	0.999857	4	0.999255
PVE	BEECH RIVER RGNL	TN	LPV	1	0.999942	1	0.999900	3	0.999811
RKW	ROCKWOOD MUNICIPAL	TN	LPV	1	0.999784	2	0.999715	4	0.999244
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	1	0.999996	1	0.999969	2	0.999850
SRB	UPPER CUMBERLAND RGNL	TN	LPV200	1	0.999799	2	0.999772	4	0.999178
SYI	BOMAR FIELD-SHELBYVILLE MUNICIPAL	TN	LPV	1	0.999846	1	0.999846	2	0.999676
SZY	ROBERT SIBLEY	TN	LPV	0	1	1	0.999996	2	0.999873
THA	TULLAHOMA RGNL/WM NORTHERN FLD	TN	LPV	1	0.999846	1	0.999846	2	0.999672
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	2	0.999360	3	0.999228	2	0.998696
TYS	MCGHEE-TYSON	TN	LPV	1	0.999765	2	0.999680	3	0.999259
UCY	EVERETT-STEWART RGNL	TN	LPV200	1	0.999965	1	0.999873	4	0.999228
11R	BRENHAM MUNICIPAL	TX	LPV	0	1	0	1	0	1
2F5	LAMESA MUNICIPAL	TX	LP	0	1	0	1	0	1
2R9	KARNES COUNTY	TX	LP	0	1	0	1	0	1
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	1	0	1	0	1
45R	HAWTHORNE FIELD	TX	LP	0	1	0	1	1	0.999996
50R	LOCKHART MUNICIPAL	TX	LPV	0	1	0	1	0	1
5C1	BOERNE STAGE FIELD	TX	LP	0	1	0	1	0	1
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	1	0	1	3	0.999961
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	1	0	1	0	1
77F	WINTERS MUNICIPAL	TX	LP	0	1	0	1	0	1
8F3	CROSBYTON MUNICIPALCIPAL	TX	LP	0	1	0	1	0	1
ABI	ABILENE RGNL	TX	LPV200	0	1	0	1	0	1
ACT	WACO RGNL	TX	LPV200	0	1	0	1	0	1
ADS	ADDISON	TX	LPV	0	1	0	1	0	1
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	1	0	1	0	1
ALI	ALICE INTL	TX	LPV	0	1	0	1	4	0.999958
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	1	0	1	0	1
ARM	WHARTON RGNL	TX	LPV	0	1	0	1	0	1
ASL	HARRISON COUNTY	TX	LPV	0	1	0	1	0	1
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	1	0	1	0	1
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	1	0	1	0	1
BAZ	NEW BRAUNFELS MUNICIPAL	TX	LPV	0	1	0	1	0	1
BBD	CURTIS FIELD	TX	LPV	0	1	0	1	0	1
BKD	STEPHENS COUNTY	TX	LP	0	1	0	1	0	1
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV	0	1	0	1	0	1
BPT	SOUTHEAST TEXAS RGNL	TX	LPV200	0	1	0	1	1	0.999988

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BRO	BROWNSVILLE/SOUTH PADRE ISLAND INTL	TX	LP	0	1	0	1	3	0.999788
BWD	BROWNWOOD RGNL	TX	LPV	0	1	0	1	0	1
BYY	BAY CITY MUNICIPAL	TX	LPV	0	1	0	1	1	0.999996
CFD	COULTER FIELD	TX	LPV	0	1	0	1	0	1
CLL	EASTERWOOD FIELD	TX	LPV200	0	1	0	1	0	1
CNW	TSTC WACO	TX	LPV200	0	1	0	1	0	1
COM	COLEMAN MUNICIPAL	TX	LPV	0	1	0	1	0	1
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	1	0	1	4	0.999950
CXO	LONE STAR EXECUTIVE	TX	LPV200	0	1	0	1	0	1
DAL	DALLAS LOVE FIELD	TX	LPV200	0	1	0	1	0	1
DFW	DALLAS-FT WORTH INTL	TX	LPV200	0	1	0	1	0	1
DKR	HOUSTON COUNTY	TX	LP	0	1	0	1	0	1
DRT	DEL RIO INTL	TX	LPV	0	1	0	1	2	0.999965
DTO	DENTON MUNICIPAL	TX	LPV	0	1	0	1	0	1
DUX	MOORE COUNTY	TX	LPV200	0	1	0	1	0	1
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	1	0	1	0	1
E01	ROY HURD MEMORIAL	TX	LP	0	1	0	1	0	1
E11	ANDREWS COUNTY	TX	LPV	0	1	0	1	0	1
E19	GRUVER MUNICIPAL	TX	LP	0	1	0	1	0	1
E30	BRUCE FIELD	TX	LPV	0	1	0	1	0	1
E38	ALPINE-CASPARIS MUNICIPALCIPAL	TX	LP	0	1	0	1	1	0.999992
EBG	EDINBURG INTL	TX	LPV	0	1	0	1	4	0.999923
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	1	0	1	0	1
EFD	ELLINGTON FIELD	TX	LPV200	0	1	0	1	1	0.999996
ELA	EAGLE LAKE	TX	LP	0	1	0	1	0	1
ELP	EL PASO INTL	TX	LP	0	1	0	1	1	0.999977
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER FLD	TX	LPV	0	1	0	1	0	1
ETN	EASTLAND MUNICIPAL	TX	LP	0	1	0	1	0	1
F00	JONES FIELD	TX	LPV	0	1	0	1	2	0.999992
F05	WILBARGER COUNTY	TX	LPV	0	1	0	1	0	1
FST	FT. STOCKTON-PECOS COUNTY	TX	LPV	0	1	0	1	1	0.999996
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	1	0	1	0	1
FWS	FORT WORTH SPINKS	TX	LPV200	0	1	0	1	0	1
GDJ	GRANBURY RGNL	TX	LPV	0	1	0	1	0	1
GGG	EAST TEXAS RGNL	TX	LPV	0	1	0	1	0	1
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	1	0	1	0	1
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	1	0	1	0	1
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	1	0	1	1	0.999985
GNC	GAINES COUNTY	TX	LPV	0	1	0	1	0	1
GRK	ROBERT GRAY AAF	TX	LPV200	0	1	0	1	0	1
GVT	MAJORS	TX	LPV	0	1	0	1	0	1
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	0	1	0	1	0	1
HBV	JIM HOGG COUNTY	TX	LPV	0	1	0	1	4	0.999958
HDO	HONDO MUNICIPAL	TX	LPV	0	1	0	1	1	0.999996
HOU	WILLIAM P HOBBY	TX	LPV200	0	1	0	1	0	1
HQZ	MESQUITE METRO	TX	LPV	0	1	0	1	0	1
HRL	VALLEY INTL	TX	LPV200	0	1	0	1	4	0.999923
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	1	0	1	0	1
IAH	GEORGE BUSH INTERCONTINENTAL/HOUSTON	TX	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
IKG	KLEBERG COUNTY	TX	LPV	0	1	0	1	4	0.999950
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	1	0	1	0	1
IWS	WEST HOUSTON	TX	LP	0	1	0	1	0	1
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	1	0	1	0	1
JSO	CHEROKEE COUNTY	TX	LPV200	0	1	0	1	0	1
JWY	MID-WAY RGNL	TX	LPV200	0	1	0	1	0	1
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	1	0	1	0	1
LBX	BRAZORIA COUNTY	TX	LPV	0	1	0	1	1	0.999988
LFK	ANGELINA COUNTY	TX	LPV	0	1	0	1	0	1
LHB	HEARNE MUNICIPAL	TX	LPV200	0	1	0	1	0	1
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	1	0	1	0	1
LNC	LANCASTER	TX	LPV200	0	1	0	1	0	1
LRD	LAREDO INTL	TX	LPV200	0	1	0	1	3	0.999954
LUD	DECATUR MUNICIPAL	TX	LPV	0	1	0	1	0	1
LVJ	PEARLAND RGNL	TX	LPV	0	1	0	1	1	0.999996
LXY	MEXIA-LIMESTONE CO	TX	LP	0	1	0	1	0	1
MAF	MIDLAND INTL	TX	LPV200	0	1	0	1	0	1
MDD	MIDLAND AIRPARK	TX	LPV	0	1	0	1	0	1
MFE	MC ALLEN MILLER INTL	TX	LPV	0	1	0	1	3	0.999799
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	1	0	1	0	1
OCH	A L MANGHAM JR RGNL	TX	LPV200	0	1	0	1	0	1
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	1	0	1	0	1
ONY	OLNEY MUNICIPAL	TX	LPV	0	1	0	1	0	1
ORG	ORANGE COUNTY	TX	LPV	0	1	0	1	1	0.999985
PEQ	PECOS MUNICIPAL	TX	LPV200	0	1	0	1	1	0.999996
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	1	0	1	4	0.999923
PPA	PERRY LEFORS FIELD	TX	LPV	0	1	0	1	0	1
PRX	COX FIELD	TX	LPV	0	1	0	1	0	1
PSX	PALACIOS MUNICIPAL	TX	LPV	0	1	0	1	1	0.999996
PVW	HALE COUNTY	TX	LPV	0	1	0	1	0	1
RAS	MUSTANG BEACH	TX	LPV	0	1	0	1	4	0.999946
RBD	DALLAS EXECUTIVE	TX	LPV	0	1	0	1	0	1
RBO	NUECES COUNTY	TX	LP	0	1	0	1	4	0.999950
RKP	ARANSAS COUNTY	TX	LPV	0	1	0	1	4	0.999958
RYW	LAGO VISTA TX - RUSTY ALLEN	TX	LP	0	1	0	1	0	1
SAT	SAN ANTONIO INTL	TX	LPV200	0	1	0	1	0	1
SGR	SUGAR LAND RGNL	TX	LPV200	0	1	0	1	0	1
SJT	SAN ANGELO RGNL/MATHIS FLD	TX	LPV	0	1	0	1	0	1
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV200	0	1	0	1	0	1
SNK	WINSTON FIELD	TX	LPV200	0	1	0	1	0	1
SWW	AVENGER FIELD	TX	LPV	0	1	0	1	0	1
T41	LA PORTE MUNICIPAL	TX	LPV	0	1	0	1	1	0.999996
T59	WHEELER MUNICIPAL	TX	LP	0	1	0	1	0	1
T78	LIBERTY MUNICIPAL	TX	LP	0	1	0	1	0	1
T82	GILLESPIE COUNTY	TX	LPV	0	1	0	1	0	1
TFP	T P MC CAMPBELL	TX	LPV	0	1	0	1	4	0.999946
TKI	COLLIN COUNTY RGNL AT MC KINNEY	TX	LPV200	0	1	0	1	0	1
TME	HOUSTON EXECUTIVE	TX	LPV	0	1	0	1	0	1
TPL	DRAUGHON-MILLER CENTRAL TEXAS RGNL	TX	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
TRL	TERRELL MUNICIPAL	TX	LPV	0	1	0	1	0	1
TYR	TYLER POUNDS RGNL	TX	LPV200	0	1	0	1	0	1
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	1	0	1	0	1
VCT	VICTORIA RGNL	TX	LPV200	0	1	0	1	0	1
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	1	0	1	0	1
BCE	BRYCE CANYON	UT	LPV	0	1	0	1	1	0.999985
BDG	BLANDING MUNICIPAL	UT	LPV	0	1	0	1	0	1
BMC	BRIGHAM CITY	UT	LP	0	1	0	1	3	0.999691
DTA	DELTA MUNICIPAL	UT	LP	0	1	0	1	1	0.999996
ENV	WENDOVER	UT	LPV	0	1	0	1	2	0.999938
FOM	FILLMORE MUNICIPAL	UT	LPV	0	1	0	1	1	0.999996
LGU	LOGAN-CACHE	UT	LPV	1	0.999958	2	0.999954	2	0.999464
OGD	OGDEN-HINCKLEY	UT	LPV	0	1	0	1	3	0.999726
PUC	CARBON COUNTY RGNL/BUCK DAVIS FIELD	UT	LP	0	1	0	1	0	1
PVU	PROVO MUNICIPAL	UT	LPV200	0	1	0	1	1	0.999996
SGU	ST GEORGE MUNICIPAL	UT	LPV	0	1	0	1	2	0.999869
SLC	SALT LAKE CITY INTL	UT	LP	0	1	0	1	3	0.999961
U14	NEPHI MUNICIPAL	UT	LPV	0	1	0	1	1	0.999996
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	1	0	1	1	0.999985
VEL	VERNAL	UT	LP	0	1	0	1	2	0.999988
0VG	LEE COUNTY	VA	LPV	2	0.999356	3	0.999225	2	0.998677
8W2	NEW MARKET	VA	LP	1	0.998449	1	0.998410	1	0.998302
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	2	0.998735	2	0.998603	1	0.998337
BCB	VIRGINIA TECH/MONTGOMERY EXECUTIVE	VA	LPV	1	0.998742	1	0.998484	1	0.998349
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV	1	0.998449	1	0.998438	1	0.998337
CJR	CULPEPER RGNL	VA	LPV	1	0.998438	1	0.998399	2	0.998221
CPK	CHESAPEAKE RGNL	VA	LPV200	2	0.998588	2	0.998565	1	0.998260
DAN	DANVILLE RGNL	VA	LPV200	3	0.999093	3	0.998827	1	0.998337
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV200	2	0.998711	2	0.998596	1	0.998337
FCI	CHESTERFIELD COUNTY	VA	LPV	1	0.998453	1	0.998445	1	0.998264
FKN	FRANKLIN MUN-JOHN BEVERLY ROSE	VA	LPV	2	0.998642	2	0.998569	1	0.998337
FVX	FARMVILLE RGNL	VA	LPV	1	0.998522	1	0.998445	1	0.998337
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	1	0.998449	1	0.998410	2	0.998252
HLX	TWIN COUNTY	VA	LPV	4	0.999194	4	0.998924	1	0.998403
HSP	INGALLS FIELD	VA	LPV	1	0.998576	1	0.998445	1	0.998337
HWY	WARRENTON-FAUQUIER	VA	LPV200	1	0.998407	1	0.998372	2	0.998218
JFZ	TAZEWELL COUNTY	VA	LPV	2	0.999020	2	0.998638	1	0.998418
JYO	LEESBURG EXECUTIVE	VA	LPV	1	0.998368	1	0.998260	2	0.998202
LKU	LOUISA COUNTY/FREEMAN FIELD	VA	LPV	1	0.998449	1	0.998441	1	0.998333
LNP	LONESOME PINE	VA	LPV	3	0.999267	3	0.998993	1	0.998465
LUA	LURAY CAVERNS	VA	LP	1	0.998449	1	0.998410	1	0.998225
LYH	LYNCHBURG RGNL/PRESTON GLENN FLD	VA	LPV	1	0.998576	1	0.998445	1	0.998337
MFV	ACCOMACK COUNTY	VA	LPV	1	0.998414	1	0.998341	2	0.998202
MKJ	MOUNTAIN EMPIRE	VA	LPV	4	0.999194	4	0.998931	1	0.998403
MTV	BLUE RIDGE	VA	LPV	3	0.999082	3	0.998816	1	0.998407
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	1	0.998449	1	0.998445	1	0.998260
OKV	WINCHESTER RGNL	VA	LPV200	1	0.998410	1	0.998302	1	0.998221

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
ORF	NORFOLK INTL	VA	LPV200	1	0.998449	1	0.998445	1	0.998256
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	1	0.998449	1	0.998445	2	0.998256
PSK	NEW RIVER VALLEY	VA	LPV200	1	0.998742	1	0.998484	1	0.998356
PTB	DINWIDDIE COUNTY	VA	LPV	1	0.998492	1	0.998445	1	0.998337
RIC	RICHMOND INTL	VA	LPV200	1	0.998449	1	0.998445	1	0.998260
RMN	STAFFORD RGNL	VA	LPV	1	0.998391	1	0.998353	2	0.998206
ROA	ROANOKE RGNL/WOODRUM FIELD	VA	LPV	1	0.998704	1	0.998445	1	0.998337
SFQ	SUFFOLK EXECUTIVE	VA	LP	2	0.998627	2	0.998565	1	0.998264
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	1	0.998488	1	0.998438	1	0.998337
VJI	VIRGINIA HIGHLANDS	VA	LPV	3	0.999275	3	0.999012	1	0.998472
W63	MARKS MUNICIPAL	VA	LP	3	0.998924	3	0.998777	1	0.998337
W78	WILLIAM M TUCK	VA	LPV	2	0.998827	2	0.998673	1	0.998337
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	1	0.998407	1	0.998360	2	0.998241
BTV	BURLINGTON INTL	VT	LPV200	1	0.997789	2	0.997782	6	0.997172
FSO	FRANKLIN COUNTY STATE	VT	LPV	1	0.997778	3	0.997712	6	0.997110
MPV	EDWARD F KNAPP STATE	VT	LPV	1	0.997836	2	0.997832	5	0.997010
RUT	RUTLAND-SOUTHERN VERMONT RGNL	VT	LPV	1	0.997932	2	0.997913	5	0.997056
ALW	WALLA WALLA RGNL	WA	LPV	3	0.998630	2	0.998499	3	0.997990
AWO	ARLINGTON MUNICIPAL	WA	LPV200	2	0.998102	2	0.997809	7	0.997542
BLI	BELLINGHAM INTL	WA	LPV200	1	0.997851	1	0.997782	6	0.997442
BVS	SKAGIT RGNL	WA	LPV	2	0.997874	2	0.997778	7	0.997469
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	1	0.997890	1	0.997762	7	0.997504
CLS	CHEHALIS-CENTRALIA	WA	LPV	3	0.998445	2	0.997986	10	0.997400
DEW	DEER PARK	WA	LPV	3	0.998241	2	0.997913	3	0.997689
EPH	EPHRATA MUNICIPAL	WA	LPV	3	0.998221	2	0.997847	5	0.997616
FHR	FRIDAY HARBOR	WA	LPV	1	0.997859	1	0.997770	7	0.997415
GEG	SPOKANE INTL	WA	LPV200	3	0.998264	2	0.997963	3	0.997681
HQM	BOWERMAN	WA	LPV200	1	0.998140	1	0.997921	13	0.997269
MWH	GRANT CO INTL	WA	LPV200	3	0.998221	3	0.998067	3	0.997650
OLM	OLYMPIA RGNL	WA	LPV	2	0.998179	2	0.997928	10	0.997527
OTH	SOUTHWEST OREGON RGNL	WA	LPV	3	0.999796	4	0.999792	29	0.997485
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	2	0.998102	2	0.997840	7	0.997542
PSC	TRI-CITIES	WA	LPV200	4	0.998592	3	0.998430	4	0.997897
PWT	BREMERTON NATIONAL	WA	LPV	2	0.998110	2	0.997847	8	0.997442
RLD	RICHLAND	WA	LPV	4	0.998522	3	0.998364	5	0.997878
RNT	RENTON MUNICIPAL	WA	LPV	2	0.998094	2	0.997832	8	0.997593
SEA	SEATTLE-TACOMA INTL	WA	LPV200	2	0.998094	2	0.997836	8	0.997523
TDO	ED CARLSON MEMORIAL - SOUTH LEWIS CO	WA	LPV	3	0.998453	3	0.998191	10	0.997465
TIW	TACOMA NARROWS	WA	LPV	2	0.998098	2	0.997867	8	0.997546
YKM	YAKIMA AIR TERMINAL/MCALLISTER FIELD	WA	LPV200	3	0.998337	3	0.998198	5	0.997801
57C	EAST TROY MUNICIPAL	WI	LPV	1	0.998252	1	0.998221	2	0.997959
82C	MAUSTON-NEW LISBON UNION	WI	LP	1	0.998183	2	0.998040	2	0.997816
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	1	0.998194	2	0.998071	2	0.997816
ARV	LAKELAND/NOBLE F. LEE MEMORIAL FIELD	WI	LPV	1	0.997824	1	0.997820	6	0.997500
ASX	JOHN F. KENNEDY MEMORIAL	WI	LPV	1	0.997820	2	0.997735	4	0.997018
ATW	OUTAGAMIE COUNTY RGNL	WI	LPV200	1	0.998183	2	0.998002	2	0.997743
AUW	WAUSAU DOWNTOWN	WI	LPV200	2	0.997982	1	0.997820	2	0.997708

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BCK	BLACK RIVER FALLS AREA	WI	LPV	1	0.998137	2	0.998009	2	0.997793
C29	MIDDLETON MUNICIPAL-MOREY FIELD	WI	LPV	1	0.998210	2	0.998140	1	0.997820
C35	REEDSBURG MUNICIPAL	WI	LP	1	0.998191	2	0.998079	1	0.997820
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	1	0.998175	2	0.997998	2	0.997724
CMY	SPARTA/FORT MC COY	WI	LPV	1	0.998148	2	0.998048	2	0.997816
CWA	CENTRAL WISCONSIN	WI	LPV200	2	0.998067	2	0.997944	2	0.997712
DLL	BARABOO WISCONSIN DELLS	WI	LPV	1	0.998194	2	0.998075	1	0.997820
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	2	0.998067	1	0.997820	2	0.997778
EGV	EAGLE RIVER UNION	WI	LPV	1	0.997855	2	0.997816	6	0.997496
ENW	KENOSHA RGNL	WI	LPV200	1	0.998414	1	0.998252	2	0.998079
ETB	WEST BEND MUNICIPAL	WI	LPV	1	0.998210	2	0.998110	1	0.997820
EZS	SHAWANO MUNICIPAL	WI	LPV	1	0.998117	1	0.997820	3	0.997716
FLD	FOND DU LAC COUNTY	WI	LPV	1	0.998194	2	0.998032	1	0.997820
GRB	AUSTIN STRAUBEL INTL	WI	LPV200	1	0.998179	2	0.997994	2	0.997735
HXF	HARTFORD MUNICIPAL	WI	LPV	1	0.998210	2	0.998137	1	0.997820
HYR	SAWYER COUNTY	WI	LPV	1	0.997820	2	0.997785	5	0.997558
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	1	0.998264	1	0.998264	2	0.997990
LNR	TRI-COUNTY RGNL	WI	LPV	1	0.998202	2	0.998094	1	0.997820
LSE	LA CROSSE MUNICIPAL	WI	LPV	1	0.998175	2	0.998090	1	0.997820
LUM	MENOMONIE MUNICIPALCIPAL-SCORE FIELD	WI	LPV	2	0.998075	1	0.997820	2	0.997770
MDZ	TAYLOR COUNTY	WI	LPV	1	0.997855	1	0.997820	3	0.997697
MFI	MARSHFIELD MUNICIPAL	WI	LPV	2	0.998090	2	0.997963	2	0.997728
MKE	GENERAL MITCHELL INTL	WI	LPV200	1	0.998221	1	0.998221	2	0.997971
MRJ	IOWA COUNTY	WI	LPV200	1	0.998210	2	0.998194	1	0.997820
MSN	DANE COUNTY RGNL-TRUAX FIELD	WI	LPV200	1	0.998210	2	0.998140	1	0.997820
MTW	MANITOWOC COUNTY	WI	LPV200	1	0.998191	2	0.998067	2	0.997797
MWC	LAWRENCE J TIMMERMAN	WI	LPV	1	0.998218	1	0.998214	1	0.997820
OCQ	J DOUGLAS BAKE MEML	WI	LP	2	0.998125	1	0.997820	3	0.997708
OSH	WITTMAN RGNL	WI	LPV	1	0.998191	2	0.998017	1	0.997820
OVS	BOSCOBEL	WI	LPV	1	0.998202	2	0.998106	1	0.997820
PBH	PRICE COUNTY	WI	LPV	1	0.997820	1	0.997820	6	0.997585
PCZ	WAUPACA MUNICIPAL	WI	LPV	1	0.998179	2	0.998009	2	0.997743
PVB	PLATTEVILLE MUNICIPALCIPAL	WI	LPV	1	0.998372	1	0.998214	1	0.997820
RAC	JOHN H. BATTEN	WI	LPV	1	0.998245	1	0.998225	2	0.998025
RCX	RUSK COUNTY	WI	LPV	1	0.997820	1	0.997820	3	0.997677
RHI	RHINELANDER-ONEIDA COUNTY	WI	LPV200	1	0.997855	1	0.997820	6	0.997581
RNH	NEW RICHMOND RGNL	WI	LPV	1	0.998067	1	0.997820	2	0.997770
RPD	RICE LAKE RGNL - CARL'S FIELD	WI	LPV	2	0.997975	1	0.997820	3	0.997697
RRL	MERRILL MUNICIPAL	WI	LPV	1	0.997855	1	0.997820	4	0.997689
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV200	1	0.998198	2	0.998086	1	0.997820
STE	STEVENS POINT MUNICIPAL	WI	LPV200	1	0.998137	2	0.998009	2	0.997728
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	1	0.998171	2	0.998036	3	0.997708
SUW	RICHARD I BONG	WI	LP	2	0.997894	2	0.997724	4	0.997130
TKV	TOMAHAWK RGNL	WI	LP	1	0.997855	1	0.997820	5	0.997650
UES	WAUKESHA COUNTY	WI	LPV200	1	0.998218	1	0.998214	1	0.997820
UNU	DODGE COUNTY	WI	LPV	1	0.998206	2	0.998125	1	0.997820
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	2	0.998098	2	0.997971	2	0.997755

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
Y50	WAUTOMA MUNICIPAL	WI	LP	1	0.998183	2	0.998021	2	0.997816
3I2	MASON COUNTY	WV	LPV	2	0.998654	1	0.998445	1	0.998302
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	1	0.998704	1	0.998445	1	0.998337
BLF	MERCER COUNTY	WV	LPV	1	0.998742	1	0.998484	1	0.998353
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV	1	0.998449	1	0.998337	1	0.998299
CRW	YEAGER	WV	LPV200	1	0.998704	1	0.998445	1	0.998337
HLG	WHEELING OHIO CO	WV	LPV200	1	0.998445	1	0.998314	1	0.998279
HTS	TRI-STATE/MILTON J. FERGUSON FIELD	WV	LPV200	1	0.998704	1	0.998445	1	0.998337
I18	JACKSON COUNTY	WV	LPV200	2	0.998576	1	0.998445	1	0.998302
LWB	GREENBRIER VALLEY	WV	LPV	1	0.998704	1	0.998445	1	0.998337
MGW	MORGANTOWN MUNICIPAL-WALTER L. BILL HART FIELD	WV	LPV200	1	0.998445	1	0.998329	1	0.998221
MRB	EASTERN WV RGNL/SHEPHERD	WV	LPV	1	0.998399	1	0.998291	2	0.998218
PKB	MID-OHIO VALLEY RGNL	WV	LPV	1	0.998449	1	0.998333	1	0.998299
SXL	SUMMERSVILLE	WV	LP	1	0.998704	1	0.998445	1	0.998337
USW	BOGGS FIELD	WV	LP	1	0.998449	1	0.998445	1	0.998302
W22	UPSHUR COUNTY RGNL	WV	LPV	1	0.998449	1	0.998410	1	0.998299
7V6	CAMP GUERNSEY	WY	LP	3	0.999093	4	0.999086	1	0.998264
COD	YELLOWSTONE RGNL	WY	LPV	3	0.998638	2	0.998418	2	0.998225
CPR	NATRONA COUNTY INTL	WY	LPV	3	0.999128	3	0.998939	2	0.998260
CYS	CHEYENNE RGNL/JERRY OLSON FIELD	WY	LPV	3	0.999900	2	0.999734	3	0.999063
DGW	CONVERSE COUNTY	WY	LPV200	3	0.999078	3	0.998827	2	0.998233
ECS	MONDELL FIELD	WY	LPV	2	0.998461	1	0.998264	2	0.998125
EVW	EVANSTON-UINTA COUNTY BURNS FIELD	WY	LPV	0	1	0	1	2	0.999734
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	2	0.998465	1	0.998264	2	0.998113
JAC	JACKSON HOLE	WY	LPV	2	0.999502	3	0.999240	1	0.998611
LAR	LARAMIE RGNL	WY	LPV	1	0.999969	1	0.999749	3	0.998931
PNA	RALPH WENZ FIELD	WY	LPV	2	0.999522	2	0.999398	1	0.998619
RIW	RIVERTON RGNL	WY	LPV200	2	0.999498	2	0.999348	1	0.998596
RKS	ROCK SPRINGS-SWEETWATER COUNTY	WY	LPV200	2	0.999965	2	0.999803	3	0.999329
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	3	0.999788	3	0.999606	3	0.998665
SAA	SHIVELY FIELD	WY	LPV	1	0.999961	1	0.999761	3	0.998935
SHR	SHERIDAN COUNTY	WY	LPV	2	0.998499	1	0.998264	2	0.998113
WRL	WORLAND MUNICIPAL	WY	LPV	3	0.998696	2	0.998480	2	0.998225
CYQH	WATSON LAKE	YT	LPV	3	0.996593	3	0.996474	11	0.995019
CYXY	WHITEHORSE / ERIK NIELSEN INTL	YT	LPV	4	0.996644	5	0.996462	7	0.995282

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

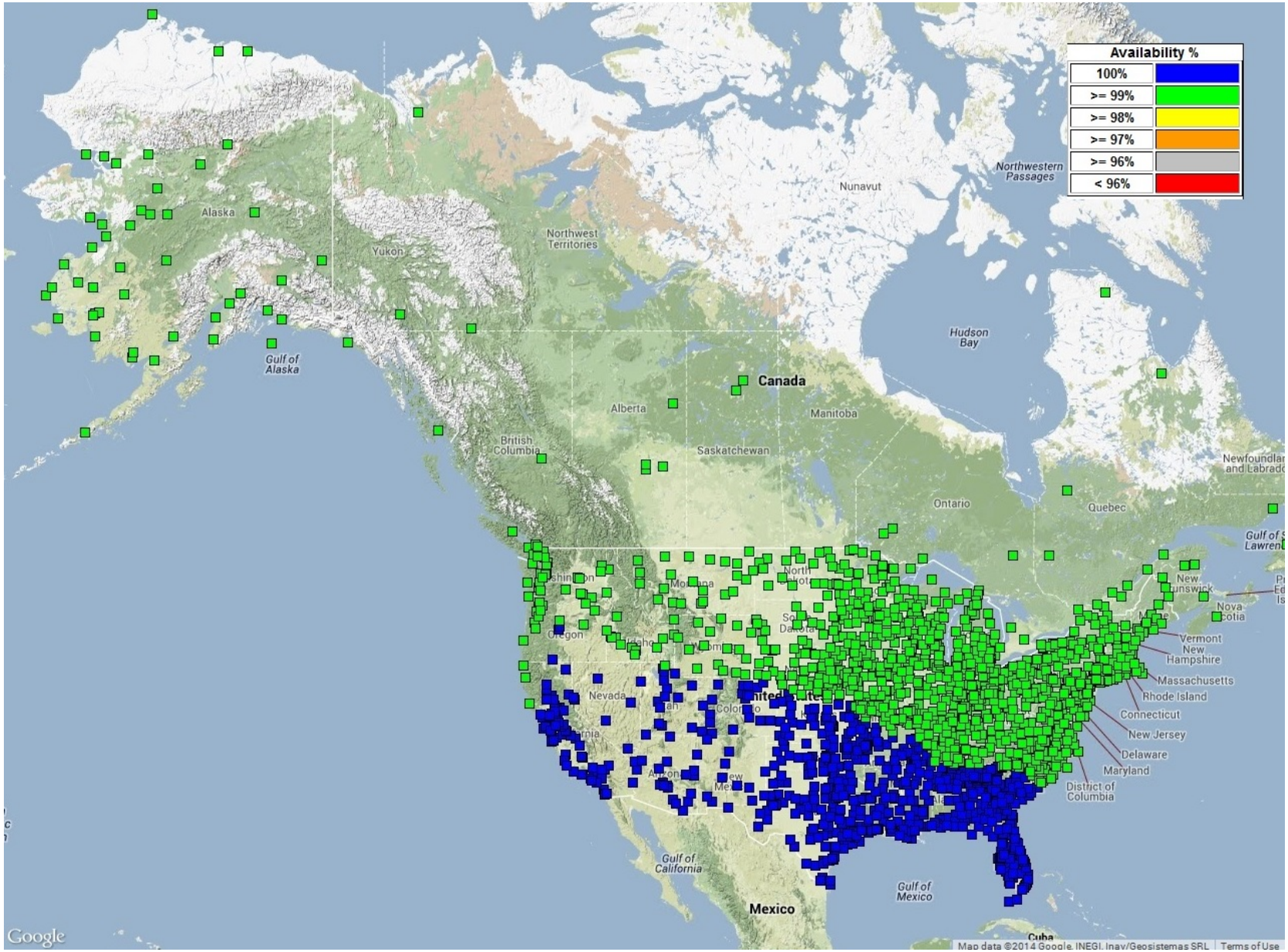


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

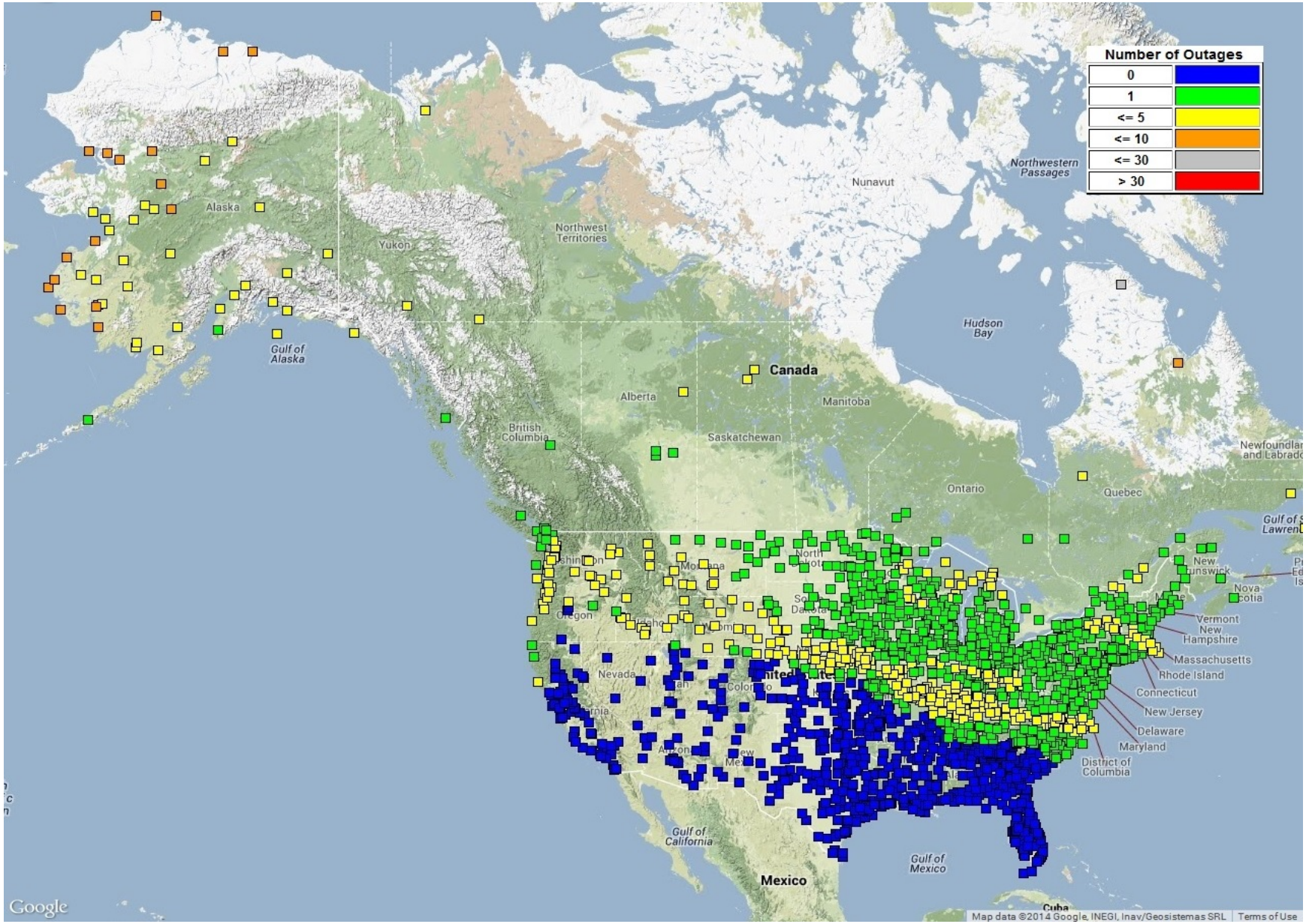


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

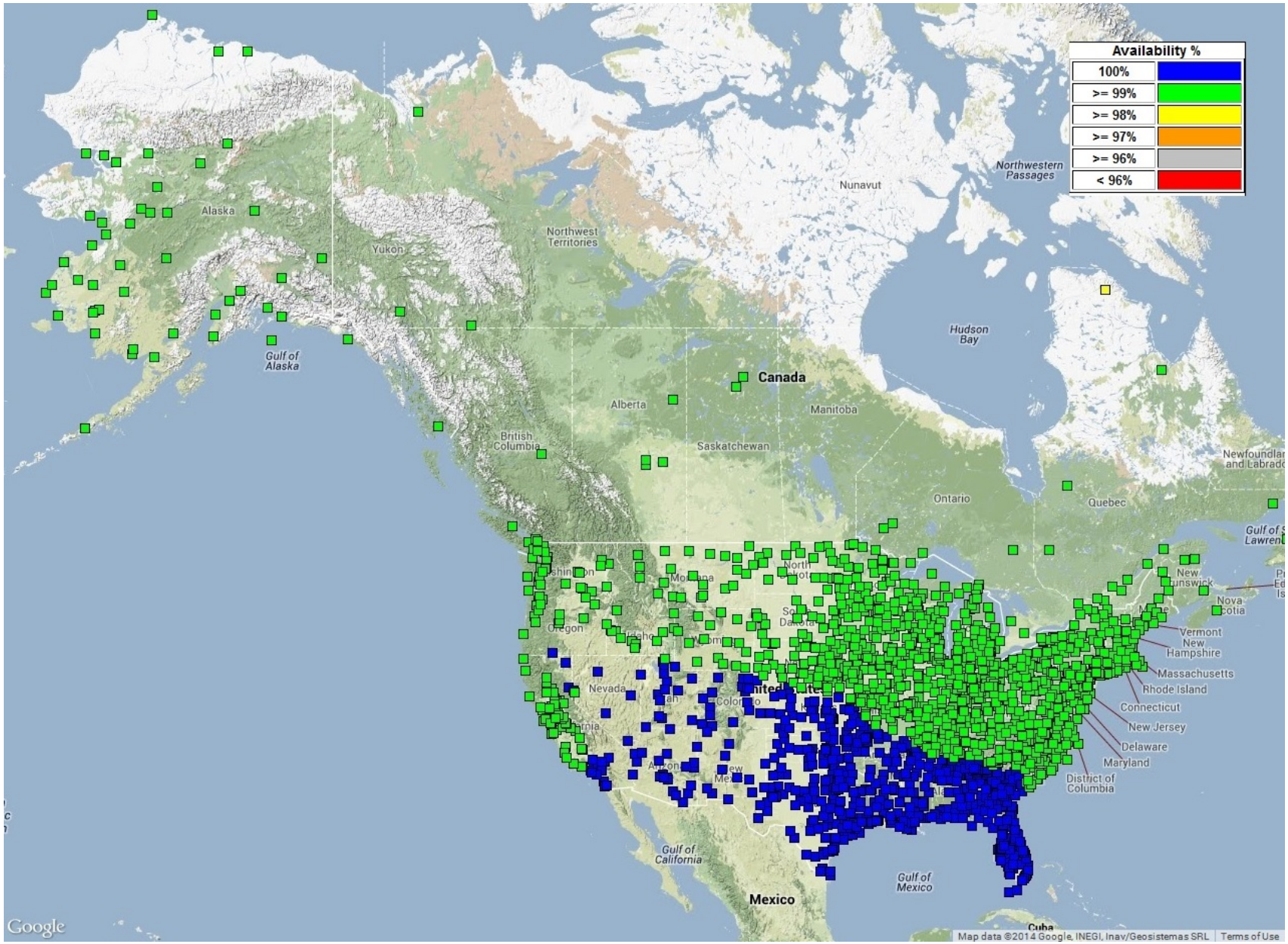


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

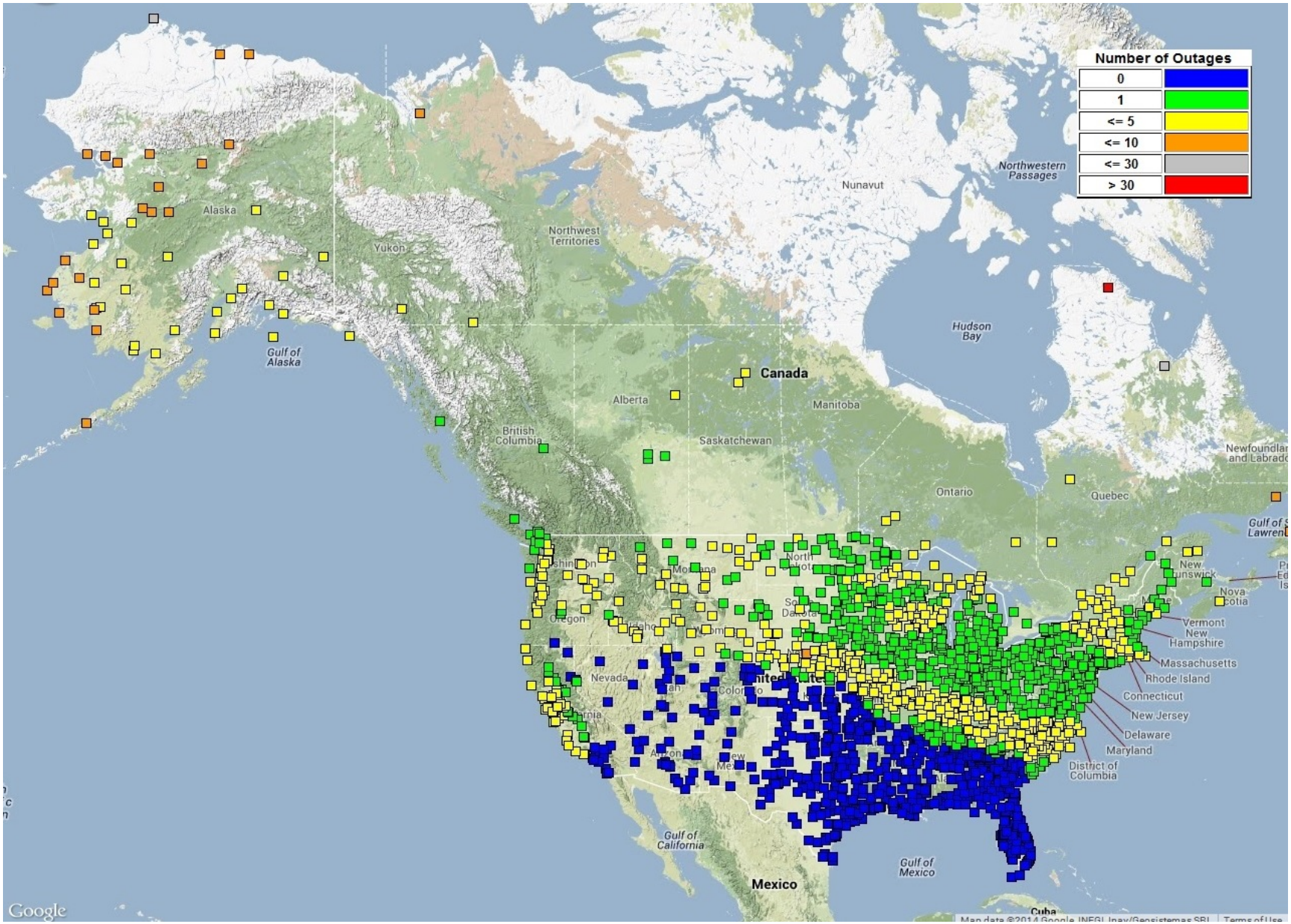


Figure 8-5 WAAS LPV 200 Availability at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

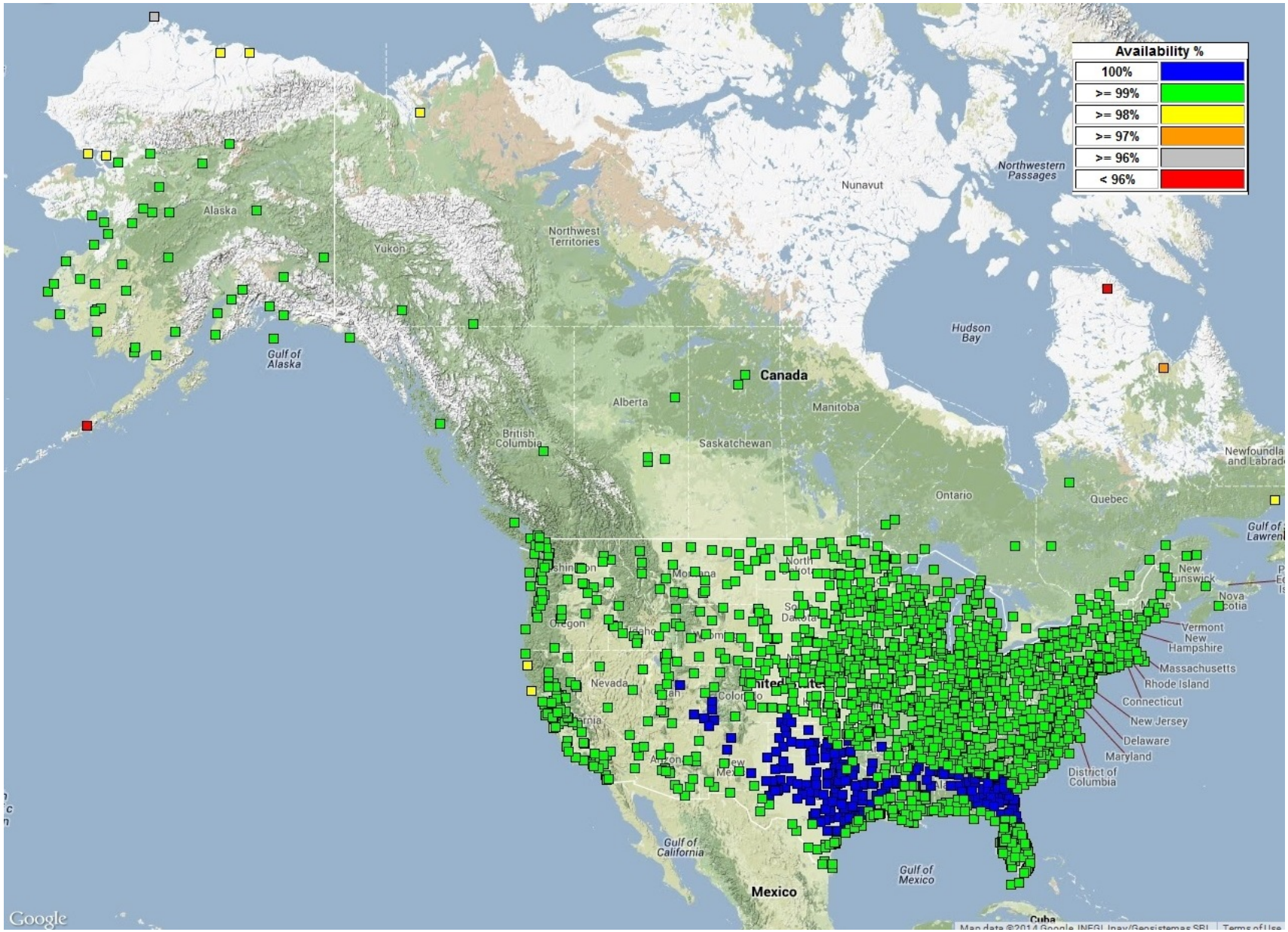
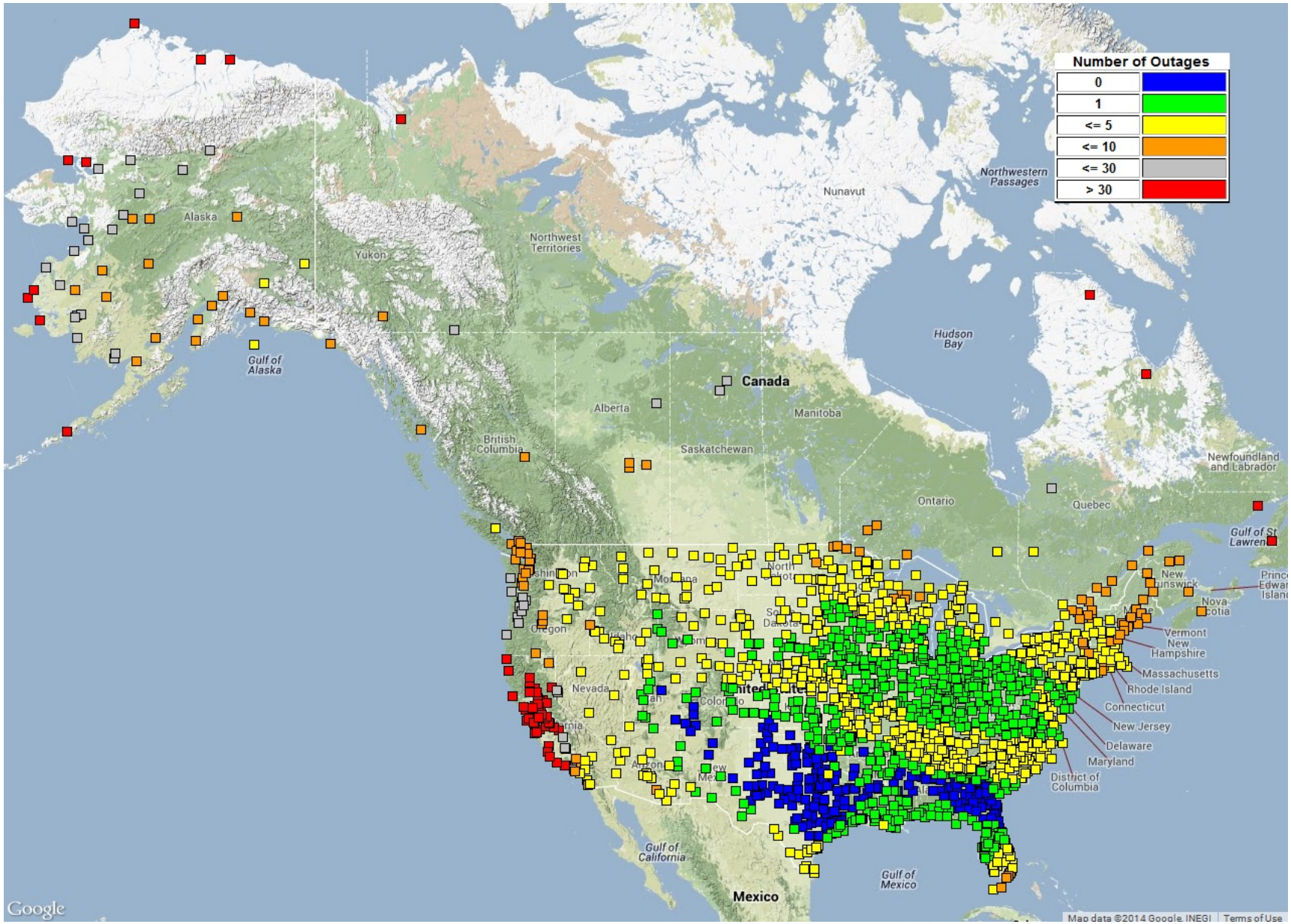


Figure 8-6 WAAS LPV 200 Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures



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	Apr 13	May 13	Jun 13	Jul 13	Aug 13	Sep 13	Oct 13	Nov 13	Dec 13	Jan 14	Feb 14	Mar 14
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	Apr 13	May 13	Jun 13	Jul 13	Aug 13	Sep 13	Oct 13	Nov 13	Dec 13	Jan 14	Feb 14	Mar 14
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 on 3/25/14 to 23:59:30 on 3/26/14 except for the following exceptions; for the Barrow (BRW) and Kotzebue (OTZ) Alaska sites the data sets were from 23:00 on 3/23/14 to 23:59:30 on 3/24/14, for the Merida Mexico thread C (MMD-C) the data set was from 00:00:00 to 23:59:30 on 3/9/14, and for Chicago (ZAU) the data set was from 23:00 on 4/4/14 to 23:59:30 on 4/5/14. The Barrow and Kotzebue needed to use different day because OPUS rejected the data as being too noisy, most likely due to ionosphere disturbance related scintillation. A different day was required for Merida C because that receiver was off line awaiting maintenance. A second set of ZAU data was processed because ZAU-C had an 8 cm difference between OPUS and CSRS in the 3/26/14 data set and because ZAU-B was one of the other larger differences which is unusual for a CONUS site.

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 used for the OPUS solutions. The value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing.

The overall RMS quality metrics reported by OPUS were all <= 2.5 cm. The CSRS surveys' RSSs of the reported ECEF sigmas for the 3/26/14 data set were all <= 9 mm. The OPUS and CSRS surveys for the 3/26/14 data set agreed to an average of 1.6 cm., with a standard deviation of 7 mm. The maximum of difference was 3.9 cm. for Honolulu thread C (HNL-C).

The OPUS positions were compared to the positions in WAAS software Release 4.0 (Build W7.006) which is the current fielded version of the WAAS software. The OPUS surveys agree with the Release 4 positions to better or equal than 6.6 cm. for all sites except Mexico City (MMX) which were 18.3 cm, 18.0 cm and 18.2 cm respectively for MMX1, MMX2, and MMX3. The non-MMX maximum was at MTP1, Tapachula Mexico thread A.

Table 10-1 lists the WAAS antenna L1 phase center positions as of 3/26/14.

Figures 10-1 to 10-3 show the RSS of the ECEF differences between the 3/26/14 OPUS survey antenna phase center locations and the locations in the WAAS Releases 4 software. Each reference station has three independent strings of WAAS receiving equipment (WRE). A surveyed antenna phase center location is required for each WRE. All three strings of a reference station are shown in the three figures. For example, BET1 identifies the RSS of the ECEF deltas for the Bethel WRE string 1(A). The next two bars in the chart are Bethel string 2(B) and Bethel string 3(C). Figure 10-4 to 10-6 show the OPUS surveys overall RMS quality indications.

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

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

Figures 10-13 to 10-15 show the RSS of the ECEF difference between the positions obtained from OPUS and the positions in the Release W7.012C version of the WAAS operational software that will be fielded mid-year 2014. The Release W7.012C positions were obtained by decoding the binary site specific adaptation files to be used by the operational software. The local velocities have been used to interpolate the positions forward in time to maximize the duration of time before the next software update for antenna positions is required. The difference on 3/26/14 for Mexico City is 24 cm, which is just below the 25 cm requirement for Mexico City. However, that error will continue to shrink over time until it passes through zero and begins to grow again. The next largest outliers, but still under the 10 cm requirement, are at Hawaii, which is the 2nd quickest moving site.

Table 10-1 WAAS Antenna Positions (OPUS IGS08) as of 3/26/14

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
BET1	-2965385.050	-972576.616	5543892.887	60.7879154055556	-161.8417251000000	52.174
BET2	-2965385.819	-972580.342	5543891.832	60.7878959666667	-161.8416645000000	52.177
BET3	-2965388.389	-972577.474	5543890.961	60.7878800222222	-161.8417292361110	52.172
BIL1	-1416445.887	-4223577.003	4550862.147	45.8037068861111	-108.5397232111110	1112.232
BIL2	-1416449.952	-4223574.869	4550862.868	45.8037161222222	-108.5397815083330	1112.240
BIL3	-1416441.584	-4223574.268	4550866.000	45.8037565972222	-108.5396819250000	1112.233
BRW1	-1886758.936	-809058.658	6018494.473	71.2827648277778	-156.7899250444440	15.572
BRW2	-1886756.351	-809055.924	6018495.648	71.2827975194444	-156.7899667388890	15.576
BRW3	-1886755.258	-809059.704	6018495.471	71.2827928944444	-156.7898577583330	15.564
CDB1	-3484099.063	-1084748.795	5213678.622	55.1923740027778	-162.7064045472220	49.699
CDB2	-3484105.706	-1084741.602	5213675.676	55.1923278861111	-162.7065433888890	49.680
CDB3	-3484111.983	-1084734.824	5213672.932	55.1922844750000	-162.7066743027780	49.698
FAI1	-2304741.820	-1448715.281	5748843.670	64.8096298805555	-147.8473409388890	149.925
FAI2	-2304741.348	-1448706.472	5748846.063	64.8096803083333	-147.8474926222220	149.925
FAI3	-2304732.814	-1448707.404	5748849.211	64.8097469416667	-147.8473804277780	149.910
HNL1	-5508637.115	-2234493.208	2303722.244	21.3129907861111	-157.9208284777780	24.665
HNL2	-5508656.272	-2234483.531	2303687.002	21.3126479277778	-157.9209843111110	25.005
HNL3	-5508647.713	-2234497.472	2303694.101	21.3127164916667	-157.9208287888890	25.079
JNU1	-2354254.903	-2388549.648	5407043.105	58.3625745250000	-134.5857071722220	16.096
JNU2	-2354252.819	-2388565.759	5407036.938	58.3624689583333	-134.5854886055560	16.097
JNU3	-2354239.600	-2388568.609	5407041.399	58.3625453805556	-134.5852935861110	16.092
MMD1	35070.420	-5959686.658	2264365.766	20.9319092861111	-89.6628406861111	29.111
MMD2	35065.493	-5959687.035	2264364.983	20.9319015555556	-89.6628880750000	29.156
MMD3	35065.148	-5959685.261	2264369.646	20.9319466250000	-89.6628912916667	29.163
MMX1	-948701.025	-5943935.112	2109212.551	19.4316537138889	-99.0683896972222	2235.073
MMX2	-948696.595	-5943934.940	2109214.974	19.4316769555556	-99.0683483138889	2235.060
MMX3	-948705.455	-5943935.301	2109210.132	19.4316304555556	-99.0684310555556	2235.102
MPR1	-1570142.221	-5759530.583	2238184.753	20.6790033638889	-105.2492032666670	10.958
MPR2	-1570139.402	-5759530.106	2238188.805	20.6790414388889	-105.2491783694440	11.265
MPR3	-1570143.506	-5759527.973	2238190.562	20.6790594055556	-105.2492217555560	10.970
MSD1	-1979519.804	-5523223.003	2493106.827	23.1604472722222	-109.7176489888890	104.282
MSD2	-1979521.366	-5523225.332	2493100.426	23.1603844750000	-109.7176556722220	104.265
MSD3	-1979525.822	-5523222.058	2493104.099	23.1604205750000	-109.7177074222220	104.258
MTP1	-254854.363	-6162909.165	1617805.070	14.7913660361111	-92.3679992722222	54.942
MTP2	-254850.740	-6162910.201	1617801.634	14.7913339694444	-92.3679652500000	54.921
MTP3	-254855.508	-6162910.315	1617800.112	14.7913199527778	-92.3680094583333	54.833
OTZ1	-2396056.035	-750356.169	5843502.505	66.8873319972222	-162.6113728444440	10.882
OTZ2	-2396052.866	-750354.340	5843504.036	66.8873668333333	-162.6113910638890	10.889

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
OTZ3	-2396052.845	-750358.273	5843503.548	66.8873555888889	-162.6113052722220	10.893
YFB1	1035381.427	-2634289.654	5696539.548	63.7314905138889	-68.5431839083333	10.037
YFB2	1035372.217	-2634296.052	5696538.187	63.7314643111111	-68.5434047972222	9.960
YFB3	1035366.146	-2634306.810	5696534.406	63.7313866194444	-68.5435988305556	10.018
YQX1	2430424.613	-3419640.394	4788223.825	48.9664900388889	-54.5976324083333	146.866
YQX2	2430432.565	-3419639.046	4788220.774	48.9664482333333	-54.5975332222222	146.868
YQX3	2430440.477	-3419637.676	4788217.776	48.9664070194444	-54.5974343083333	146.882
YWG1	-520164.387	-4083475.939	4855843.045	49.9005743694444	-97.2593977750000	222.105
YWG2	-520150.513	-4083468.878	4855850.436	49.9006773916667	-97.2592186333333	222.117
YWG3	-520152.391	-4083478.000	4855842.614	49.9005682361111	-97.2592285194444	222.115
YYR1	1885341.417	-3321428.368	5091171.664	53.3086471250000	-60.4194684500000	37.855
YYR2	1885344.367	-3321419.885	5091176.076	53.3087134750000	-60.4193671416667	37.855
YYR3	1885340.083	-3321413.066	5091182.075	53.3088036472222	-60.4193725333333	37.859
ZAB1	-1488636.848	-5003946.533	3654557.703	35.1735753805556	-106.5673498527780	1620.119
ZAB2	-1488631.514	-5003948.221	3654557.683	35.1735747305556	-106.5672884611110	1620.186
ZAB3	-1488632.288	-5003950.806	3654553.826	35.1735323138889	-106.5672885138890	1620.170
ZAN1	-2659536.653	-1549114.774	5567750.751	61.2292017111111	-149.7802509000000	80.693
ZAN2	-2659548.414	-1549110.824	5567746.252	61.2291179750000	-149.7804246361110	80.684
ZAN3	-2659541.361	-1549106.695	5567750.735	61.2292016277778	-149.7804249694440	80.680
ZAU1	138704.100	-4761244.144	4227763.934	41.7826580555556	-88.3313368805556	195.891
ZAU2	138704.368	-4761248.753	4227758.767	41.7825956833333	-88.3313352722222	195.889
ZAU3	138711.073	-4761248.492	4227758.850	41.7825966361111	-88.3312545638889	195.896
ZBW1	1490299.209	-4448983.169	4306010.496	42.7357205305556	-71.4804259833333	39.110
ZBW2	1490304.320	-4448981.155	4306010.839	42.7357245472222	-71.4803589916667	39.133
ZBW3	1490306.028	-4448984.784	4306006.532	42.7356717361111	-71.4803532888889	39.136
ZDC1	1069125.751	-4839598.987	4001126.515	39.1015959666667	-77.5427466666667	80.066
ZDC2	1069128.142	-4839603.614	4001120.302	39.1015239416667	-77.5427312138889	80.054
ZDC3	1069124.044	-4839602.706	4001122.495	39.1015493277778	-77.5427752083333	80.063
ZDV1	-1273628.614	-4711375.563	4094890.105	40.1873032916667	-105.1272244138890	1541.344
ZDV2	-1273622.914	-4711377.088	4094890.125	40.1873035166667	-105.1271551444440	1541.345
ZDV3	-1273624.925	-4711380.284	4094885.840	40.1872530694444	-105.1271681416670	1541.338
ZFW1	-659983.203	-5324060.785	3438276.477	32.8306497277778	-97.0664718222222	155.629
ZFW2	-659988.472	-5324063.342	3438271.478	32.8305962777778	-97.0665243083333	155.596
ZFW3	-659983.497	-5324063.844	3438271.677	32.8305983416667	-97.0664709194444	155.608
ZHU1	-513864.472	-5506451.702	3166720.471	29.9618963527778	-95.3314262833333	10.846
ZHU2	-513867.126	-5506455.113	3166714.317	29.9618318444444	-95.3314503750000	10.928
ZHU3	-513873.399	-5506457.742	3166708.711	29.9617736111111	-95.3315125527778	10.901
ZJX1	772646.439	-5434462.193	3237231.749	30.6988596888889	-81.9081851666667	2.142
ZJX2	772649.768	-5434463.736	3237228.343	30.6988240777778	-81.9081530305556	2.120
ZJX3	772645.699	-5434466.159	3237225.229	30.6987915166667	-81.9081986416667	2.100

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZKC1	-415247.523	-4954556.394	3982161.122	38.8801594222222	-94.7908338972222	305.906
ZKC2	-415231.132	-4954557.706	3982161.167	38.8801600833333	-94.7906444083333	305.886
ZKC3	-415237.250	-4954561.061	3982155.981	38.8801019277778	-94.7907114361111	305.631
ZLA1	-2474409.952	-4637294.636	3602183.536	34.6035183388889	-118.0838955972220	763.510
ZLA2	-2474404.678	-4637297.431	3602183.541	34.6035184638889	-118.0838305333330	763.499
ZLA3	-2474411.284	-4637297.127	3602179.568	34.6034744444444	-118.0838956250000	763.581
ZLC1	-1808273.224	-4486410.821	4145303.023	40.7860433055556	-111.9521776722220	1287.437
ZLC2	-1808274.617	-4486414.439	4145298.533	40.7859899000000	-111.9521769555560	1287.439
ZLC3	-1808270.411	-4486416.141	4145298.527	40.7859898222222	-111.9521232111110	1287.439
ZMA1	966042.293	-5662999.811	2761581.501	25.8246122638889	-80.3191898472222	-7.599
ZMA2	966029.318	-5662999.109	2761585.984	25.8246599861111	-80.3193162333333	-8.232
ZMA3	966037.401	-5662997.952	2761586.341	25.8246620277778	-80.3192348250000	-7.880
ZME1	4070.888	-5226189.298	3644028.432	35.0673941722222	-89.9553700333333	68.609
ZME2	4070.916	-5226186.743	3644032.532	35.0674376527778	-89.9553697055556	68.873
ZME3	4064.723	-5226186.612	3644032.696	35.0674395666667	-89.9554375972222	68.856
ZMP1	-249978.391	-4539297.502	4458955.059	44.6374632944444	-93.1520856027778	262.661
ZMP2	-249972.591	-4539297.843	4458955.057	44.6374631444444	-93.1520123777778	262.675
ZMP3	-249973.692	-4539302.117	4458950.576	44.6374070888889	-93.1520232722222	262.606
ZNY1	1406144.623	-4627343.980	4144322.060	40.7843286444444	-73.0971658111111	6.446
ZNY2	1406146.415	-4627347.019	4144317.279	40.7842758777778	-73.0971559638889	5.919
ZNY3	1406140.860	-4627348.675	4144317.320	40.7842763388889	-73.0972246361111	5.923
ZOA1	-2684436.875	-4293337.396	3865351.872	37.5430539777778	-122.0159478750000	-3.501
ZOA2	-2684433.870	-4293341.467	3865349.438	37.5430263833333	-122.0158946222220	-3.510
ZOA3	-2684438.238	-4293342.342	3865345.580	37.5429820333333	-122.0159312805560	-3.437
ZOB1	650770.176	-4754715.670	4187420.752	41.2971544805556	-82.2064448194444	223.680
ZOB2	650777.856	-4754714.839	4187422.768	41.2971668222222	-82.2063526305556	225.174
ZOB3	650776.184	-4754719.661	4187414.975	41.2970870638889	-82.2063802138889	223.450
ZSE1	-2308930.272	-3668169.673	4663526.477	47.2869932694444	-122.1883728666670	82.098
ZSE2	-2308934.661	-3668175.213	4663520.062	47.2869076944444	-122.1883829555560	82.151
ZSE3	-2308935.722	-3668179.491	4663516.127	47.2868560222222	-122.1883647000000	82.099
ZSU1	2462589.449	-5529372.122	2003724.478	18.4313357861111	-65.9934766805556	-28.092
ZSU2	2462587.519	-5529377.492	2003712.190	18.4312186916667	-65.9935140472222	-28.068
ZSU3	2462594.142	-5529375.231	2003710.106	18.4311990333333	-65.9934480722222	-28.130
ZTL1	529840.398	-5305248.809	3489342.852	33.3796886138889	-84.2967260638889	261.135
ZTL2	529846.772	-5305247.963	3489343.136	33.3796917861111	-84.2966570000000	261.117
ZTL3	529847.453	-5305251.407	3489337.901	33.3796350388889	-84.2966533972222	261.155

Figure 10-1 WAAS Release 4 Antenna Positions Deltas from 3/26/14 OPUS Survey

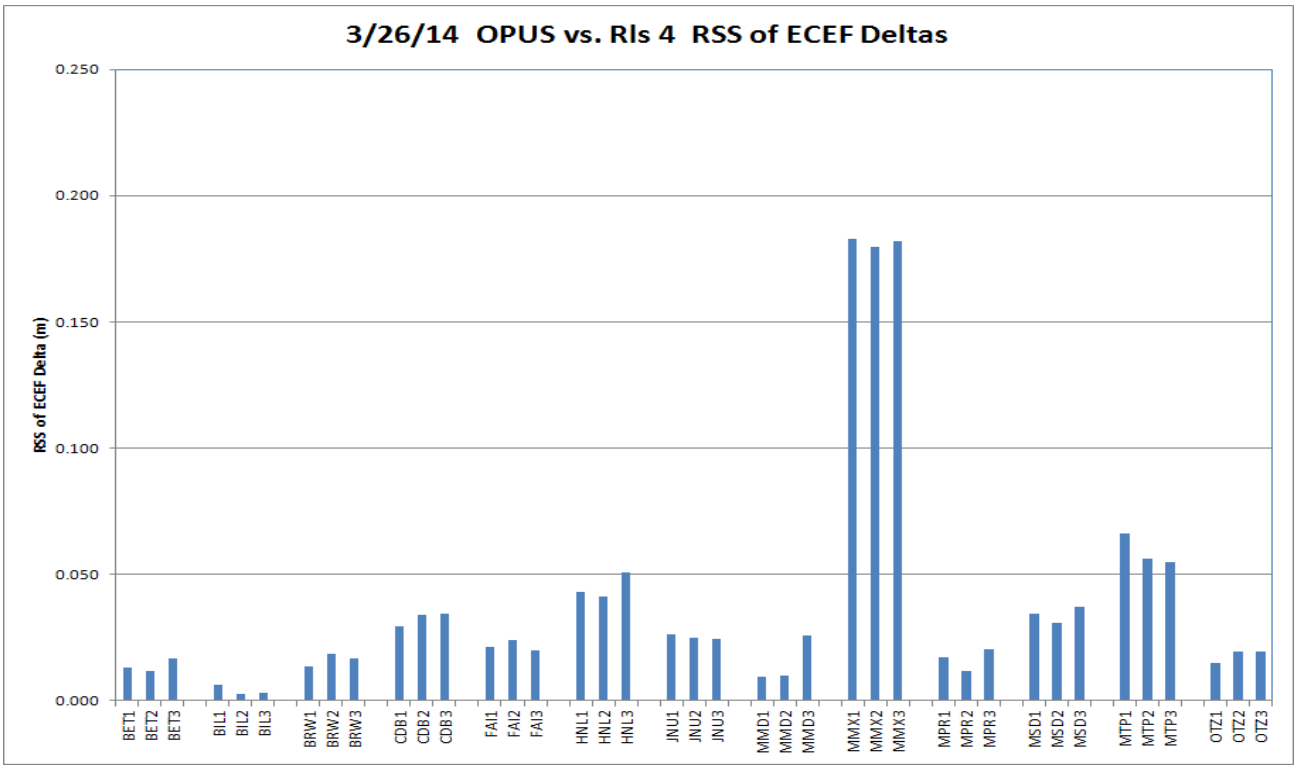


Figure 10-2 WAAS Release 4 Antenna Positions Deltas from 3/26/14 OPUS Survey

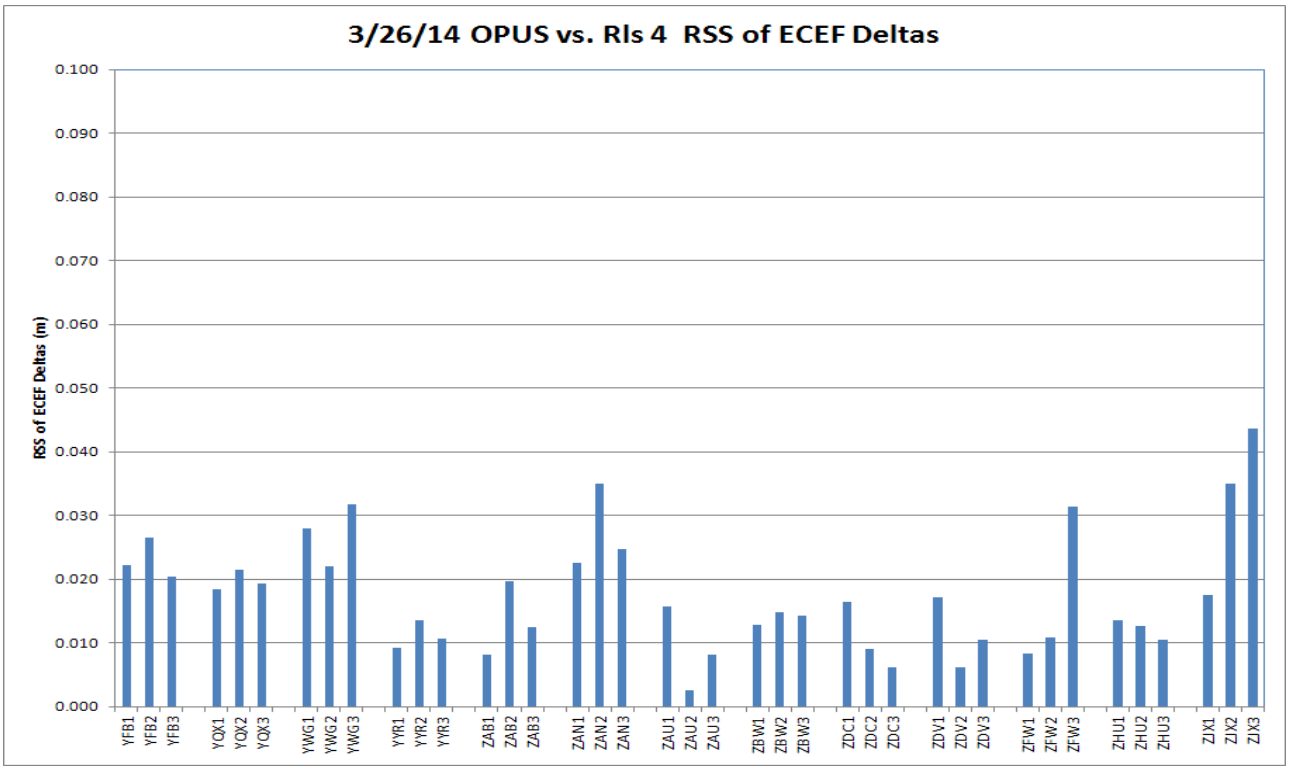


Figure 10-3 WAAS Release 4 Antenna Positions Deltas from 3/26/14 OPUS Survey

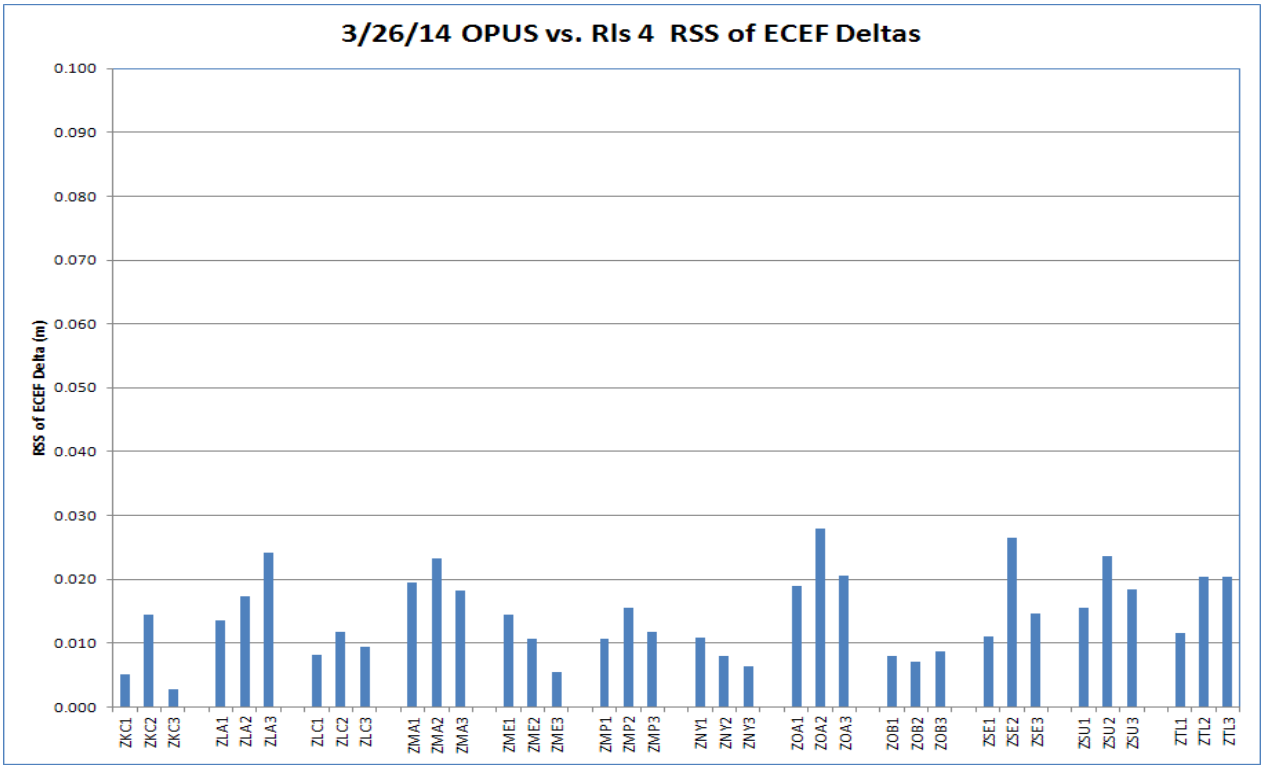


Figure 10-4 3/26/14 OPUS Survey Overall RMS Qualities

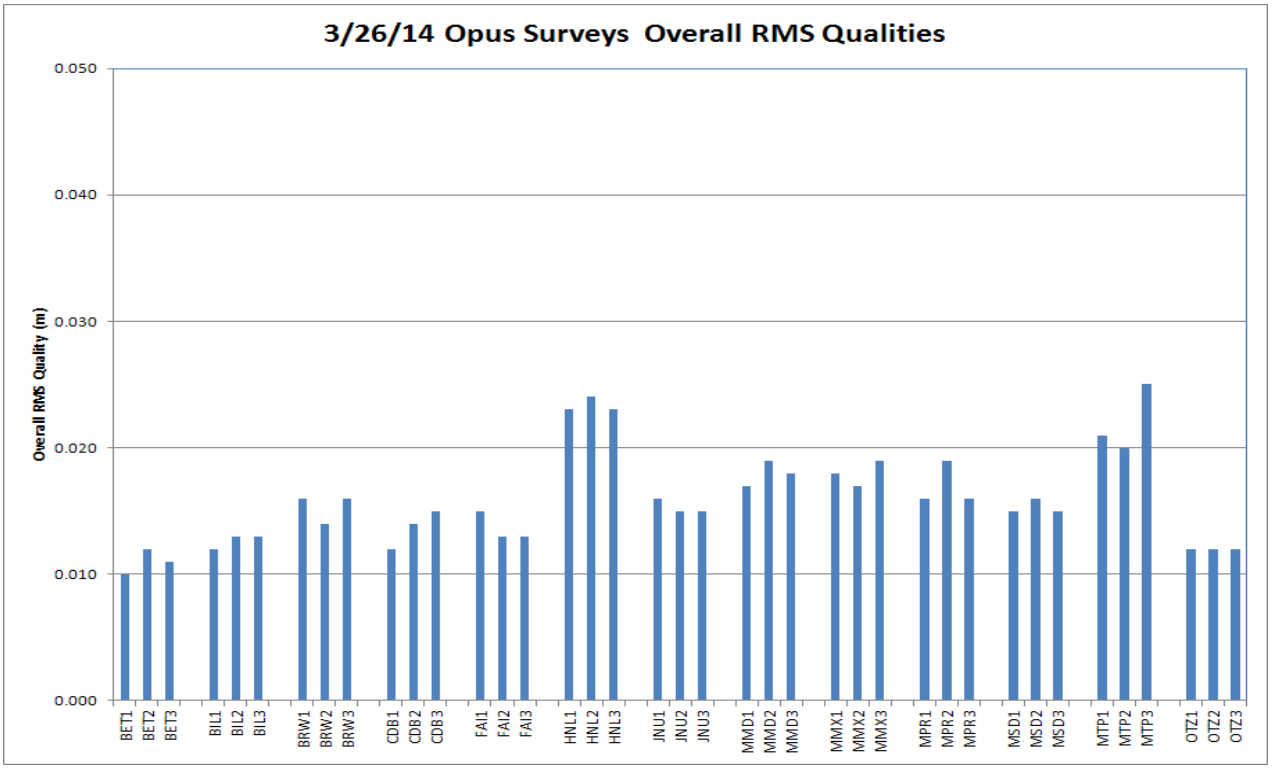


Figure 10-5 3/26/14 OPUS Survey Overall RMS Qualities

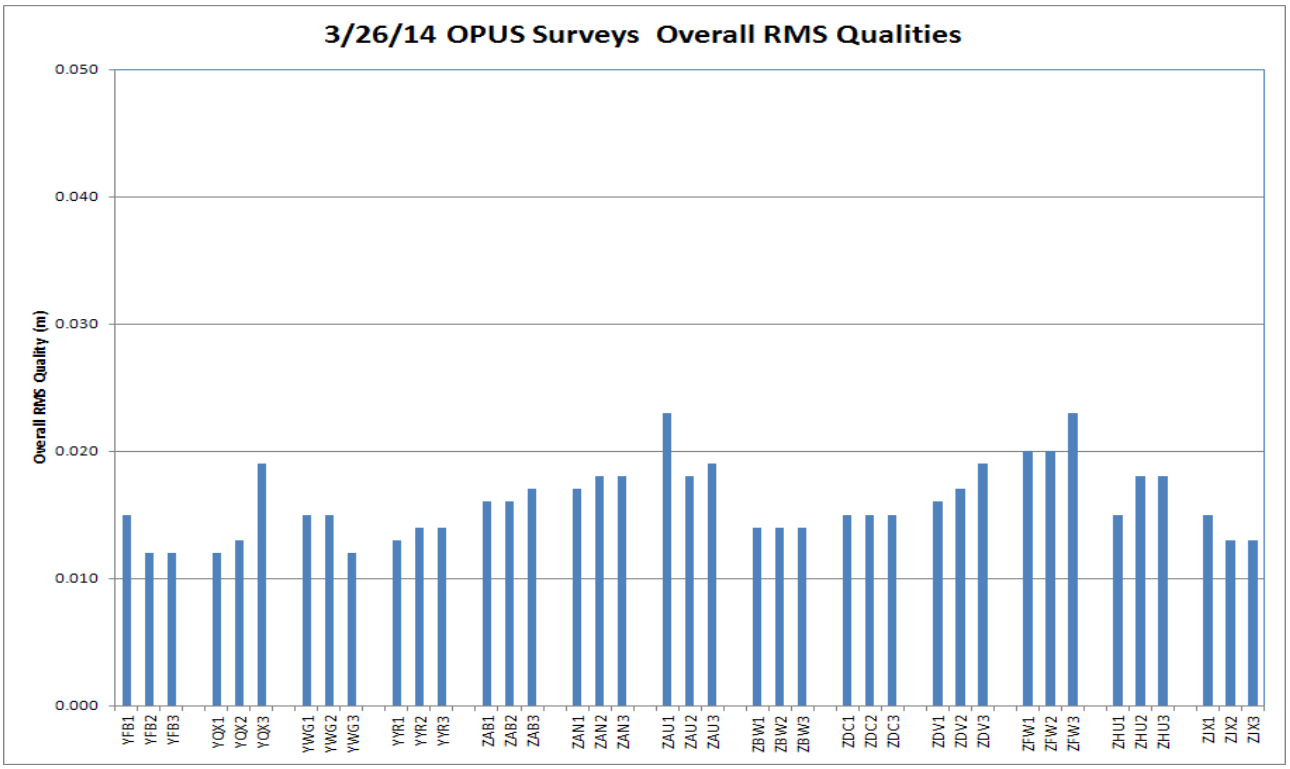


Figure 10-6 3/26/14 OPUS Survey Overall RMS Qualities

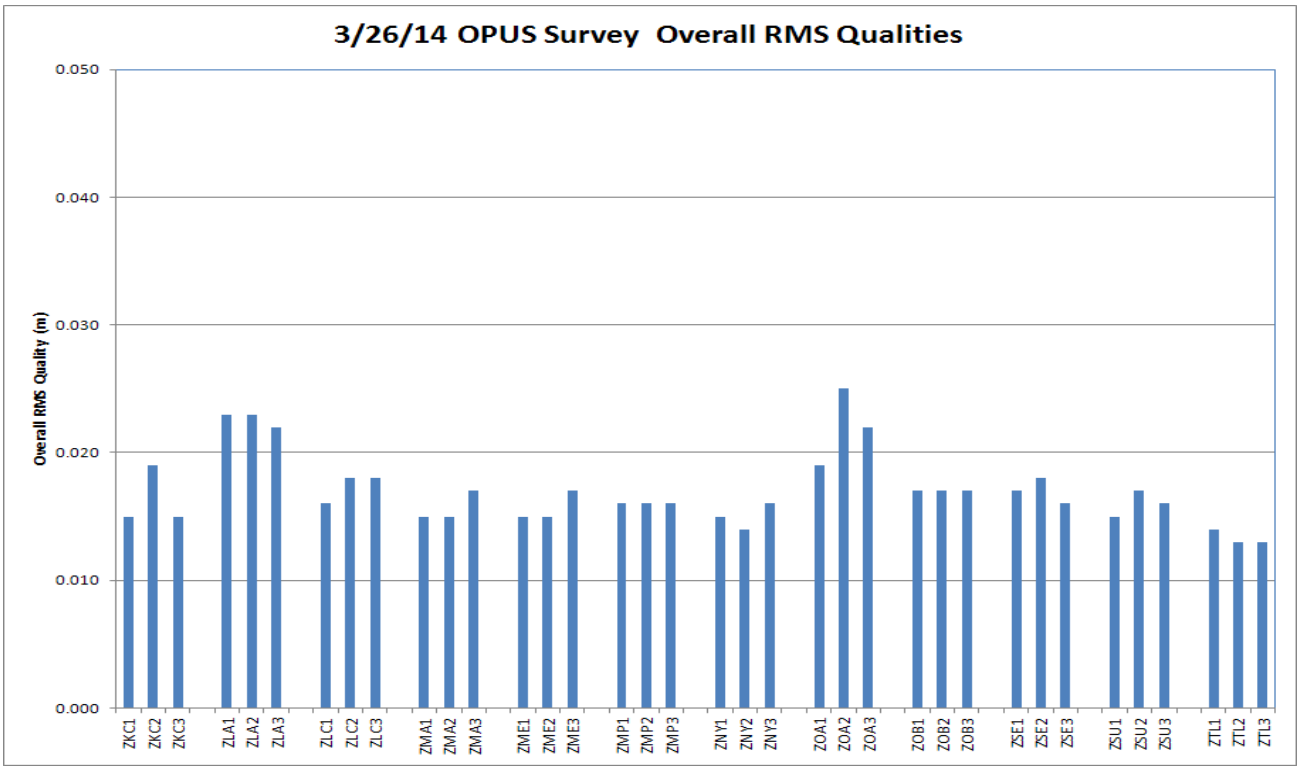


Figure 10-7 3/26/14 OPUS vs. CSRS RSS ECEF Deltas

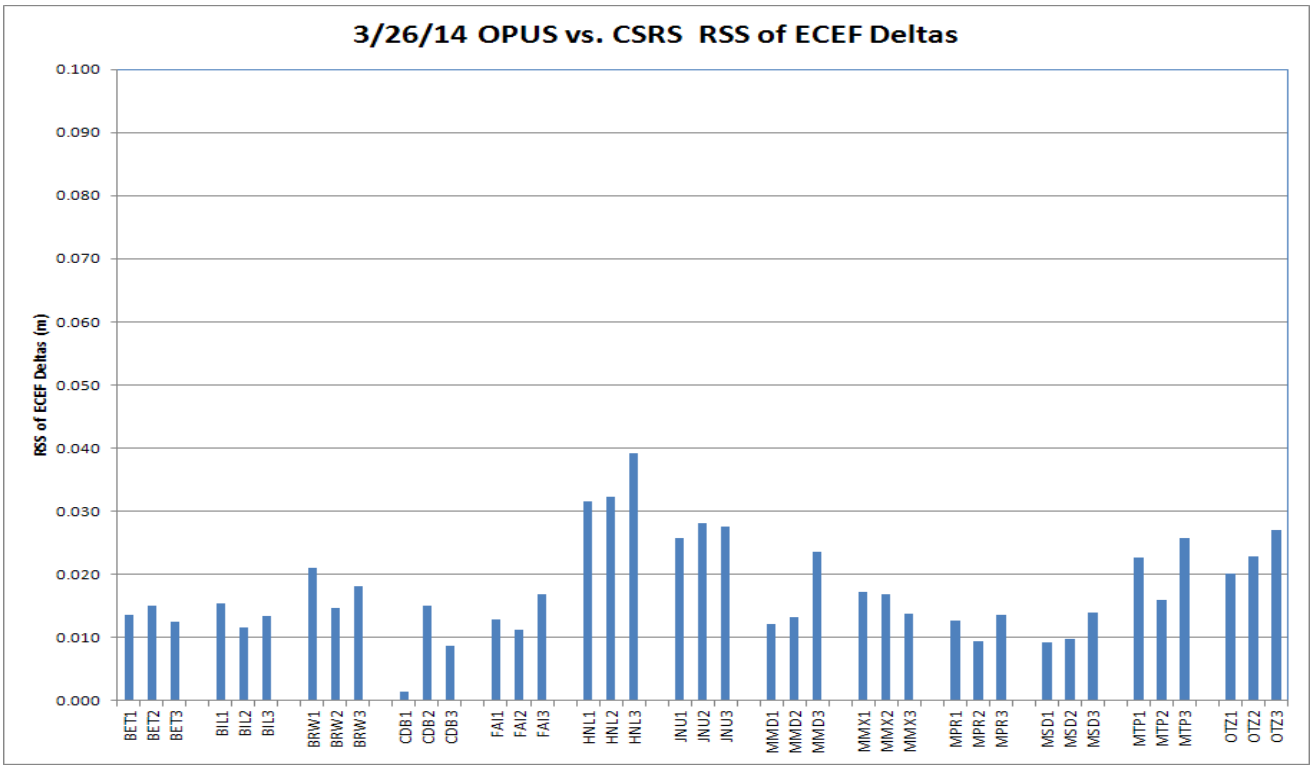


Figure 10-8 3/26/14 OPUS vs. CSRS RSS ECEF Deltas

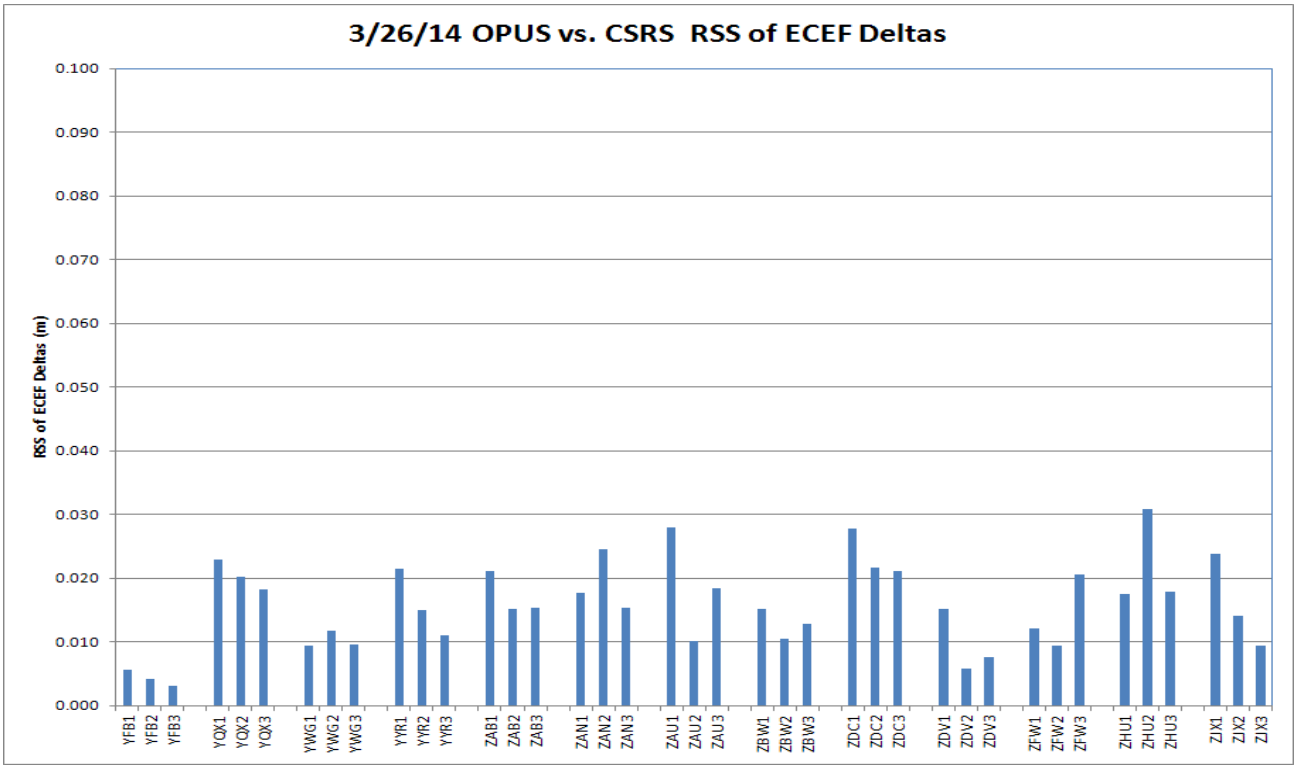


Figure 10-9 3/26/14 OPUS vs. CSRS RSS ECEF Deltas

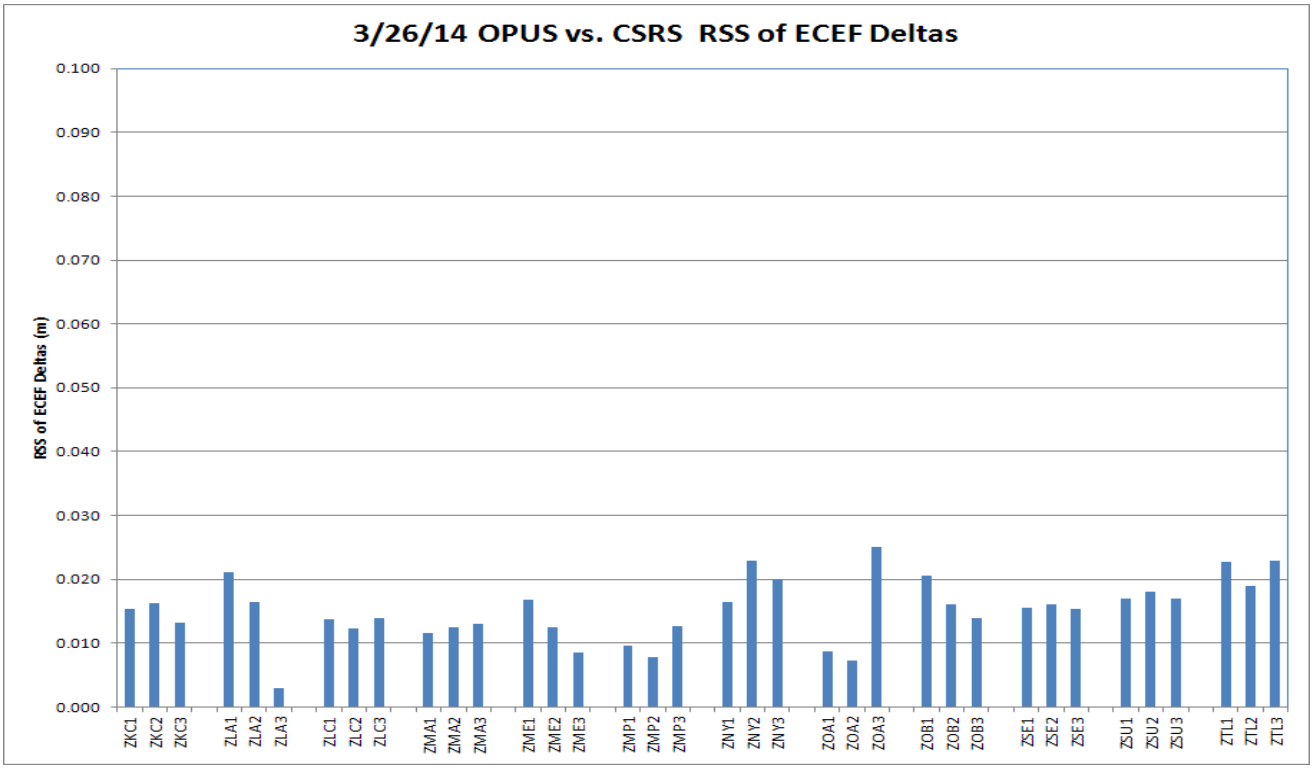


Figure 10-10 3/26/14 CSRS Survey Qualities

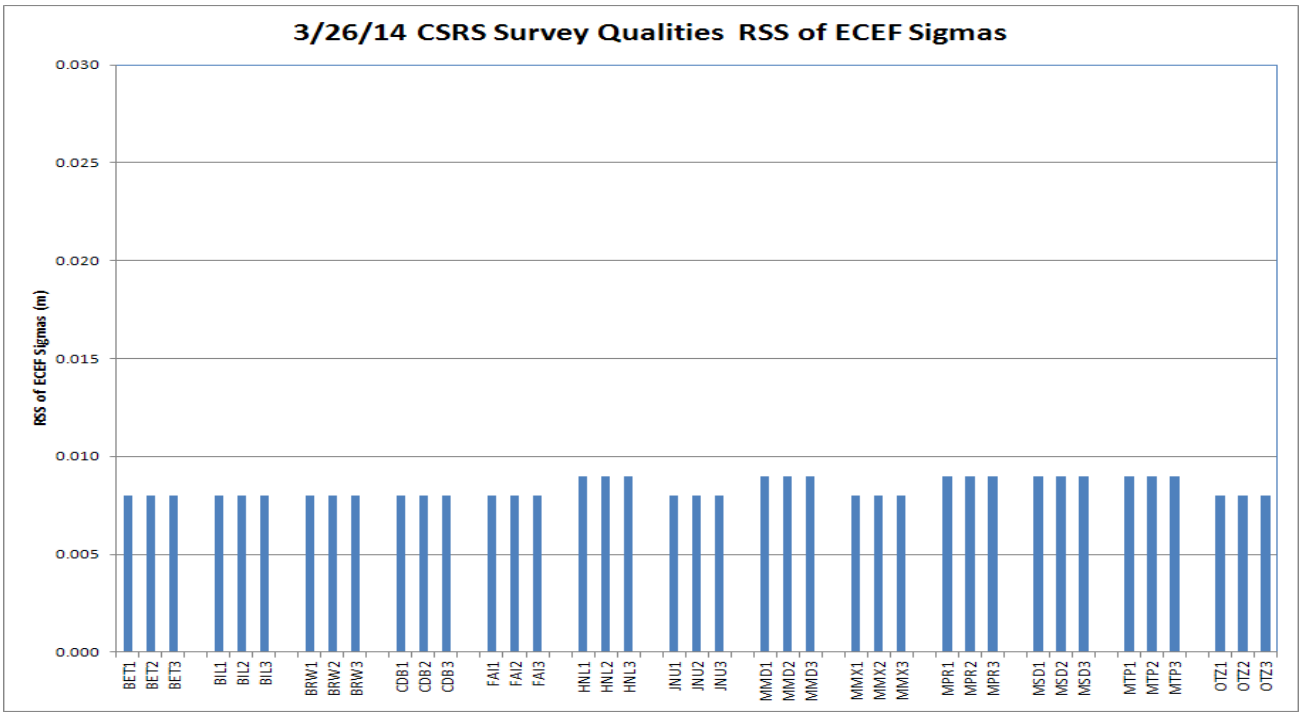


Figure 10-11 3/26/14 CSRS Survey Qualities

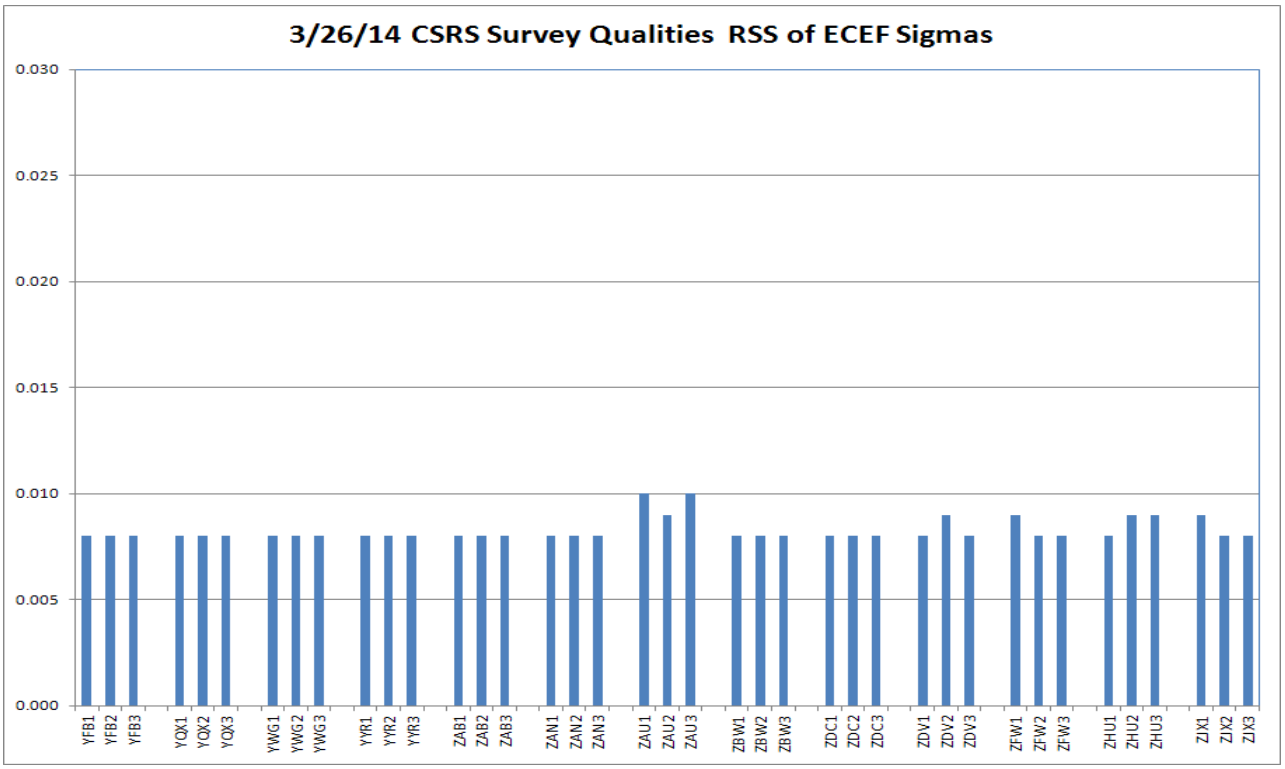


Figure 10-12 3/26/14 CSRS Survey Qualities

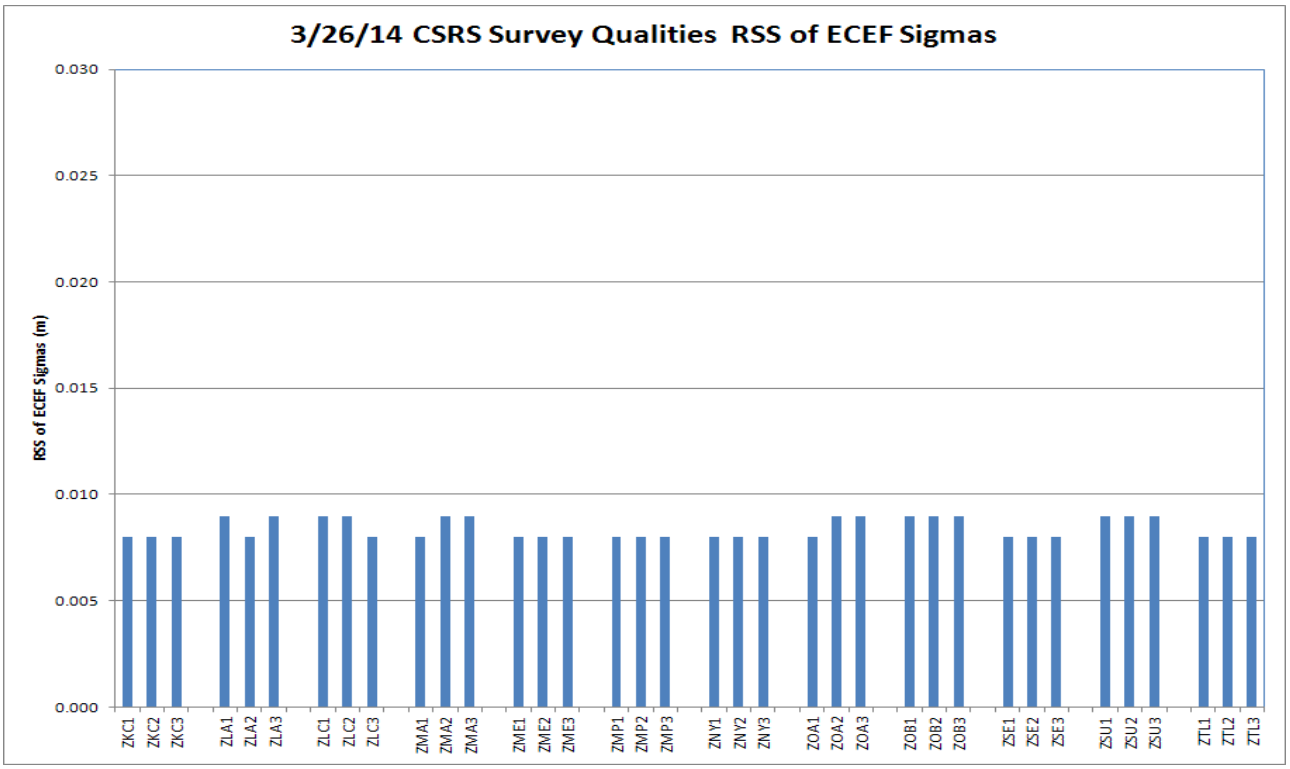


Figure 10-13 3/26/14 OPUS vs. RLS W7.012C

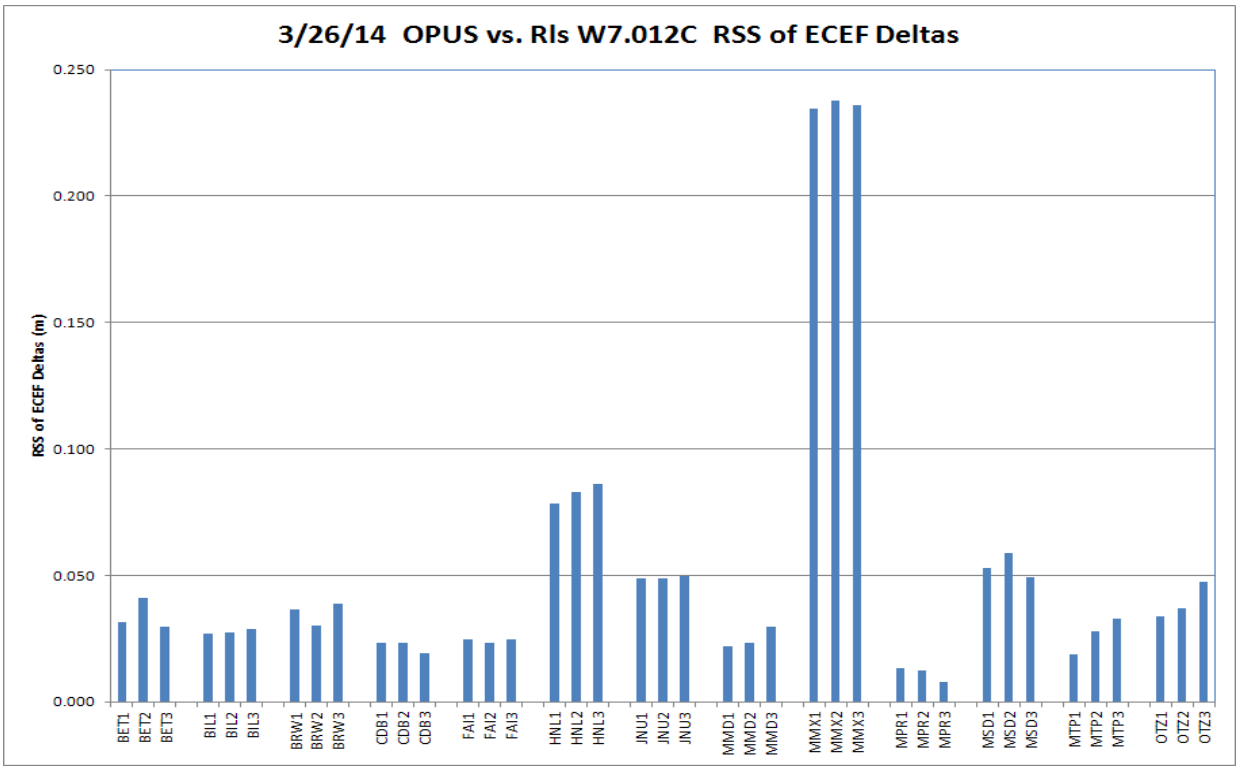


Figure 10-14 3/26/14 OPUS vs. RLS W7.012C

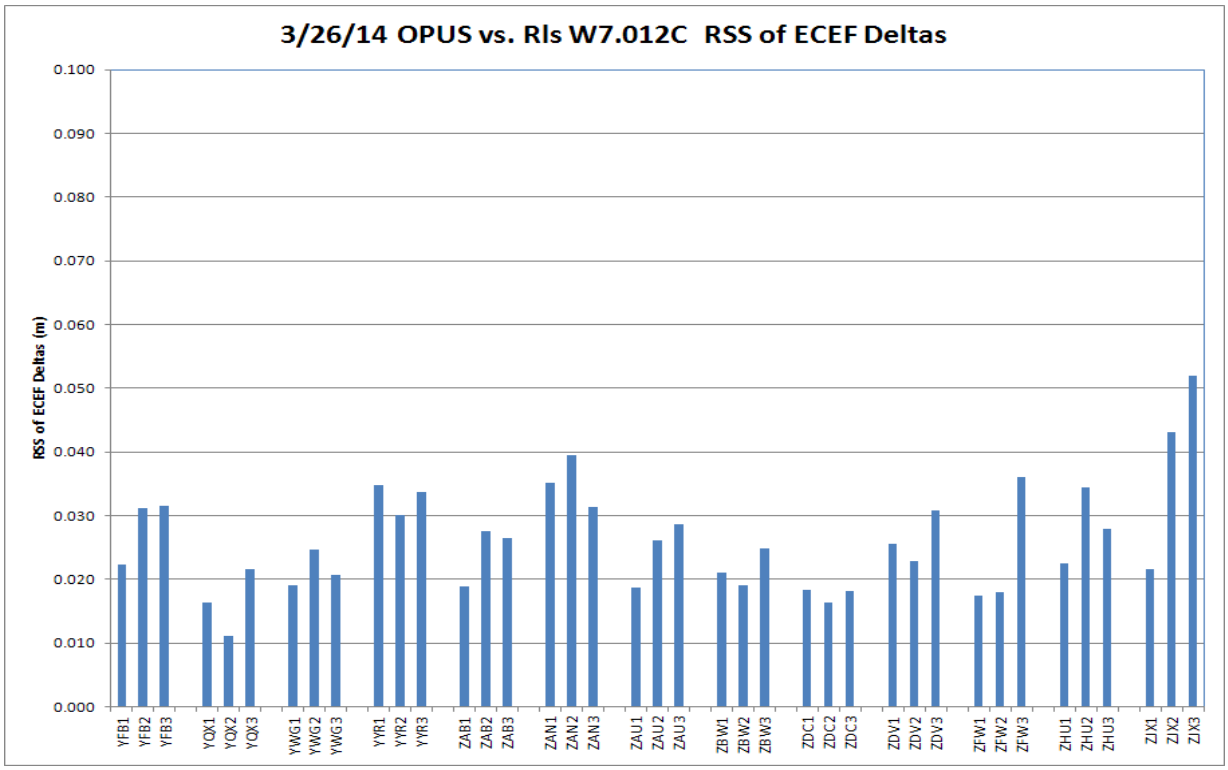
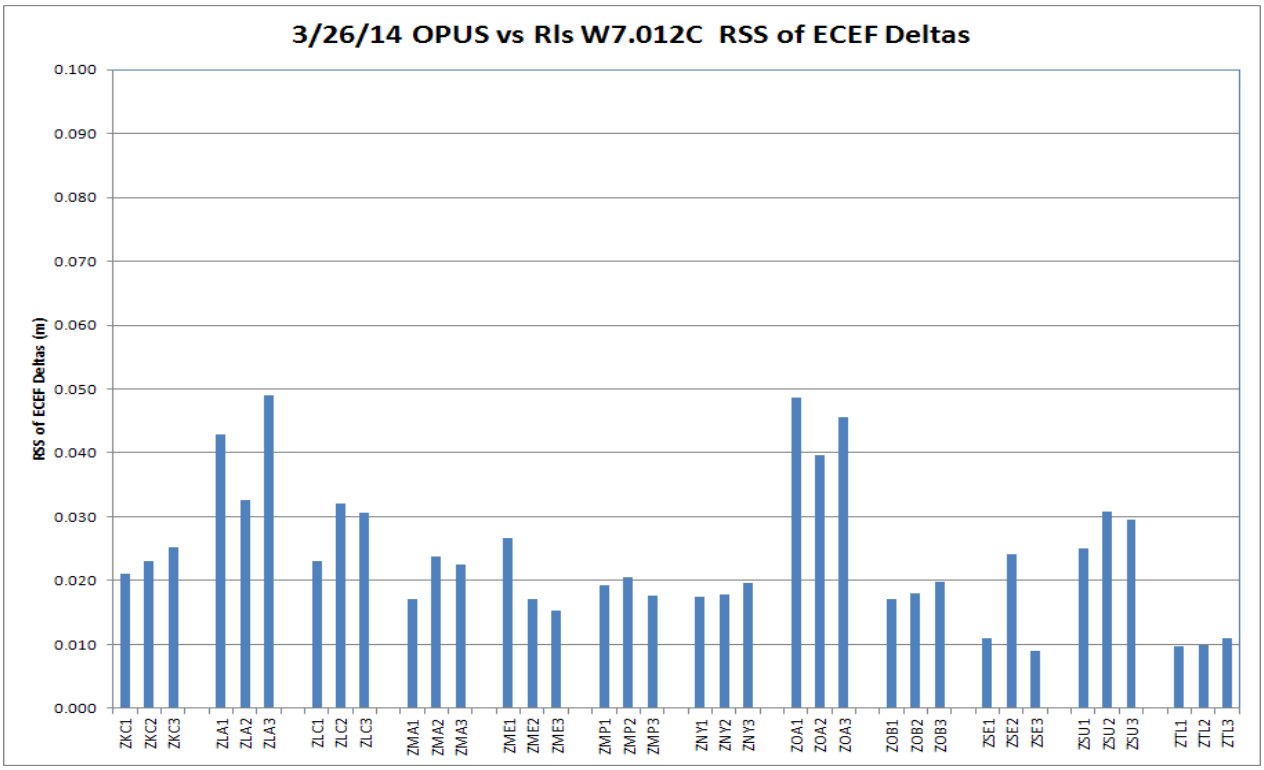


Figure 10-15 3/26/14 OPUS vs. RLS W7.012C



11.0 SIGNAL QUALITY MONITOR (SQM)

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

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

11.1 Alpha Metrics

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

Table 11-1 Alpha Metrics

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

11.2 Type Bias

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

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

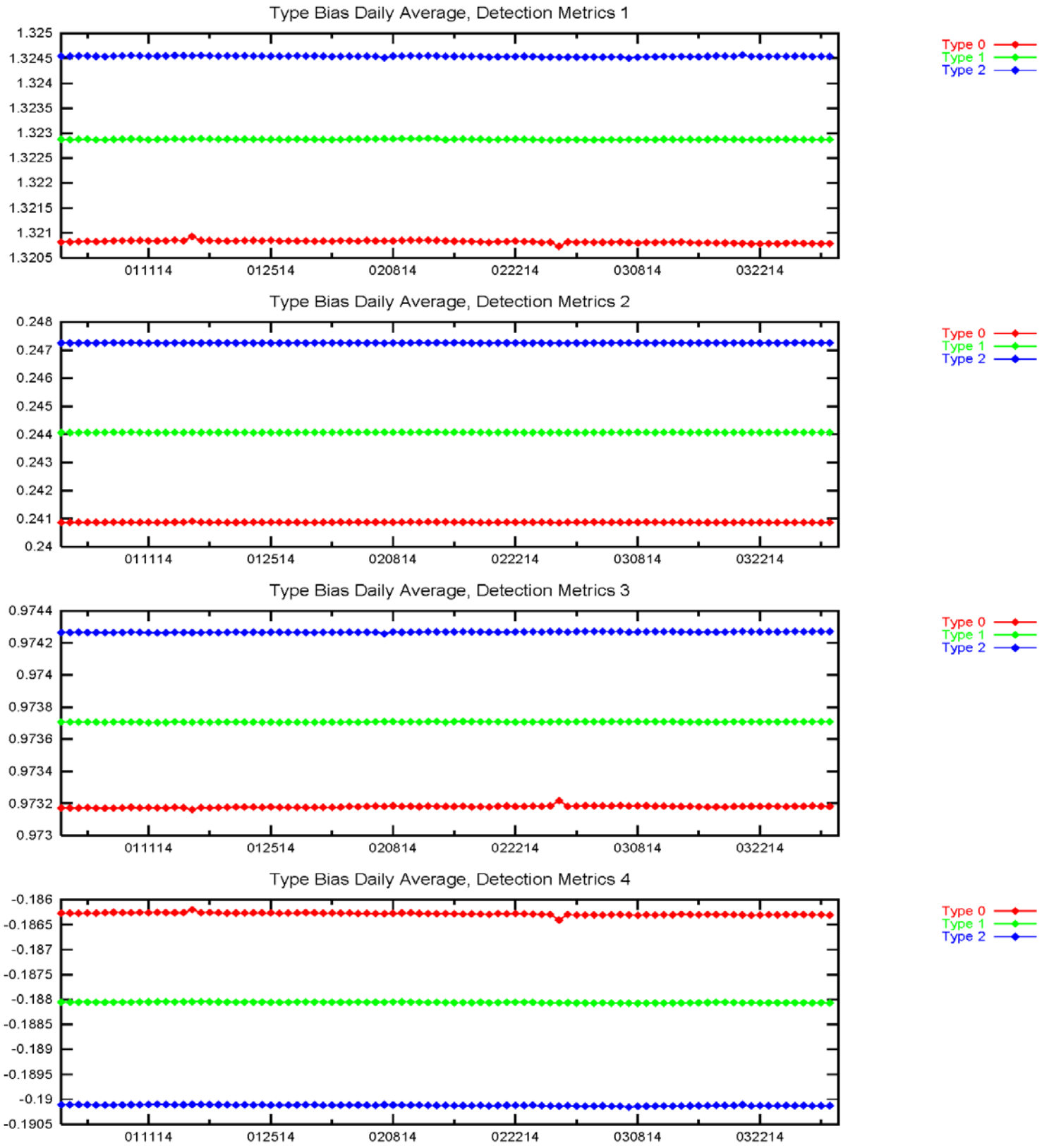
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.32082000	1.32287000	1.32454000
DM 2	0.24086900	0.24407000	0.24725700
DM 3	0.97317900	0.97370700	0.97426800
DM 4	-0.18628200	-0.18805800	-0.19011900

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.32091000	1.32288000	1.32459000
DM 2	0.24084900	0.24409100	0.24727300
DM 3	0.97317400	0.97370900	0.97427500
DM 4	-0.18621600	-0.18806400	-0.19010200

Figure 11-1 Type Bias Average Trend



11.3 PRN Bias

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

Table 11-4 and Figure 11-2 show the rollup PRN bias average for the quarter. Figures 11-3 to 11-10 show the PRN bias average trend for each SV. The maximum average for DM1 for this quarter is PRN 23 at 0.00103801. The maximum average for DM2 is PRN 11 at 0.0002085. The maximum average for DM3 is PRN 10 at 0.00024995 and the maximum average for DM4 is PRN 23 at 0.00043834.

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-6 (SVN-36) was decommissioned on 2/21/13.

Table 11-4 PRN Bias Average for the Quarter

PRN	SVN	DM1	DM2	DM3	DM4
1	63	0.00018127	0.00011320	0.00008827	0.00009744
2	61	0.00054296	0.00012034	0.00009422	0.00010918
3	33	0.00016277	0.00006820	0.00010175	0.00032847
4	34	0.00017230	0.00004537	0.00006088	0.00012563
5	50	0.00011969	0.00012233	0.00005917	0.00010409
6	36	0.00020115	0.00006550	0.00005957	0.00009959
7	34	0.00012411	0.00007550	0.00003189	0.00013060
8	38	0.00014679	0.00015633	0.00003636	0.00010158
9	39	0.00015300	0.00004583	0.00006214	0.00009651
10	40	0.00061919	0.00004578	0.00024995	0.00009399
11	46	0.00095135	0.00020851	0.00005942	0.00024727
12	58	0.00015718	0.00007482	0.00009885	0.00007763
13	43	0.00057854	0.00004981	0.00007925	0.00015992
14	41	0.00068879	0.00012744	0.00011758	0.00012054
15	55	0.00012597	0.00005837	0.00002733	0.00014277
16	56	0.00012737	0.00006693	0.00011713	0.00033524
17	53	0.00014675	0.00006713	0.00003692	0.00012074
18	54	0.00068482	0.00012165	0.00004953	0.00024118
19	59	0.00044794	0.00016108	0.00004423	0.00009183
20	51	0.00012958	0.00005081	0.00003808	0.00016584
21	45	0.00037807	0.00011996	0.00016885	0.00011157
22	47	0.00037497	0.00005362	0.00009450	0.00033655
23	60	0.00103801	0.00016821	0.00003824	0.00043834
24	65	0.00022190	0.00005075	0.00003677	0.00011639
25	62	0.00031220	0.00018444	0.00008719	0.00012599
26	26	0.00021800	0.00006778	0.00013396	0.00009608
27	66	0.00061838	0.00019222	0.00007746	0.00029811
28	44	0.00028741	0.00004469	0.00002724	0.00008775
29	57	0.00026965	0.00005798	0.00009658	0.00029455
30	30				
31	52	0.00038914	0.00014978	0.00003798	0.00024305
32	23	0.00019132	0.00005549	0.00009822	0.00010176

Figure 11-2 PRN Bias Average for the Quarter

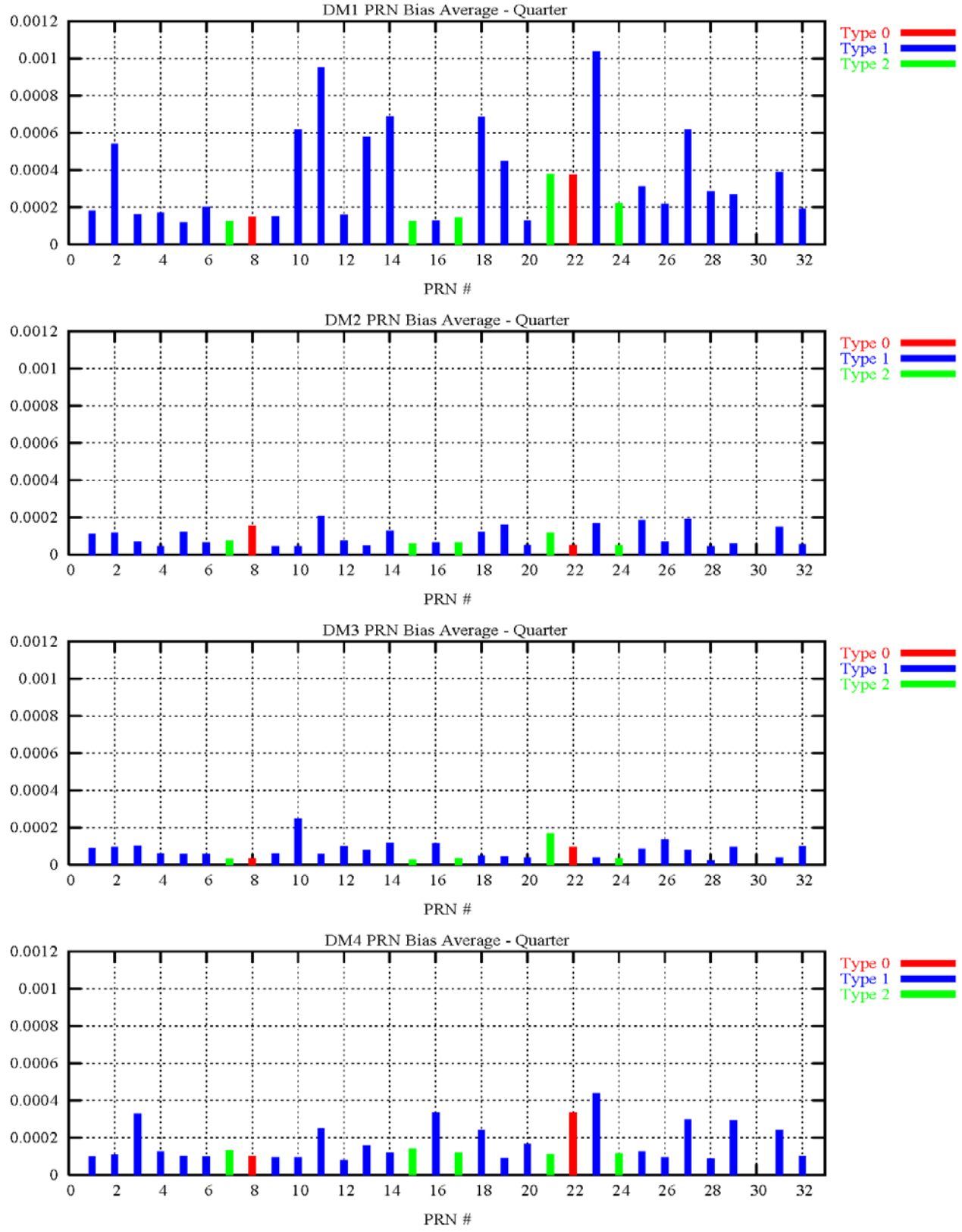


Figure 11-3 PRN Bias Average Trend (PRN 1 – PRN 4)

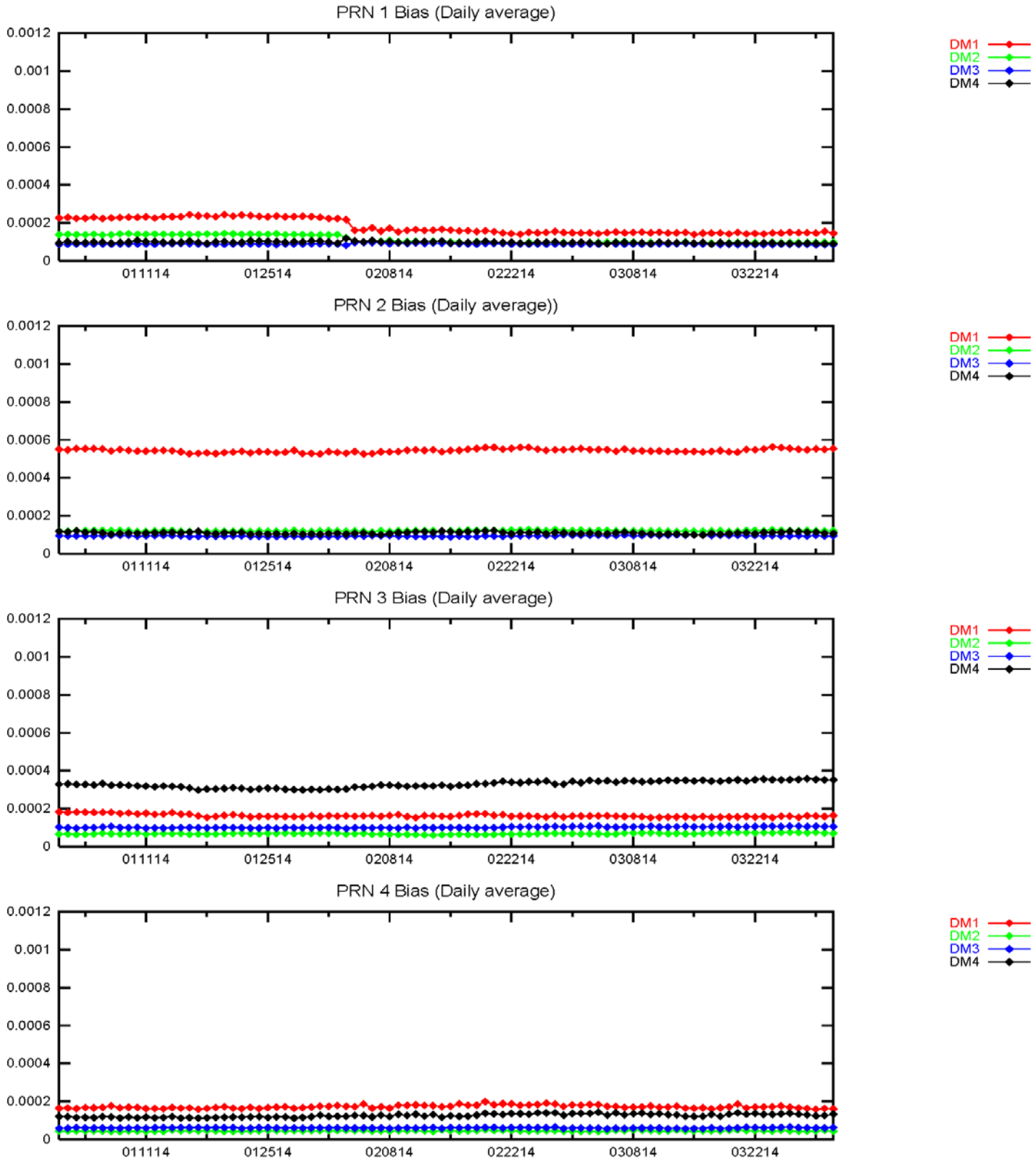


Figure 11-4 PRN Bias Average Trend (PRN 5 – PRN 8)

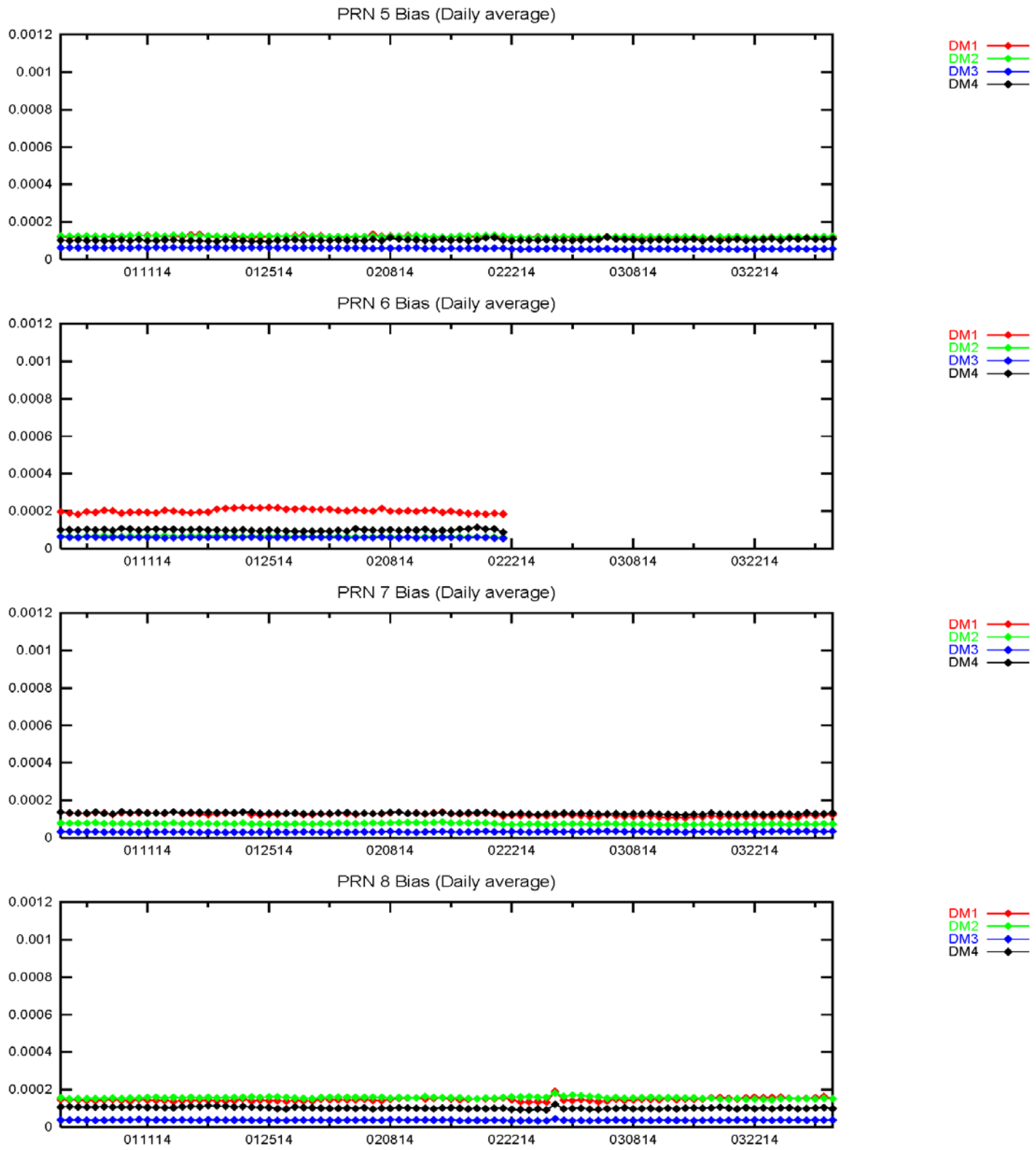


Figure 11-5 PRN Bias Average Trend (PRN 9 – PRN 12)

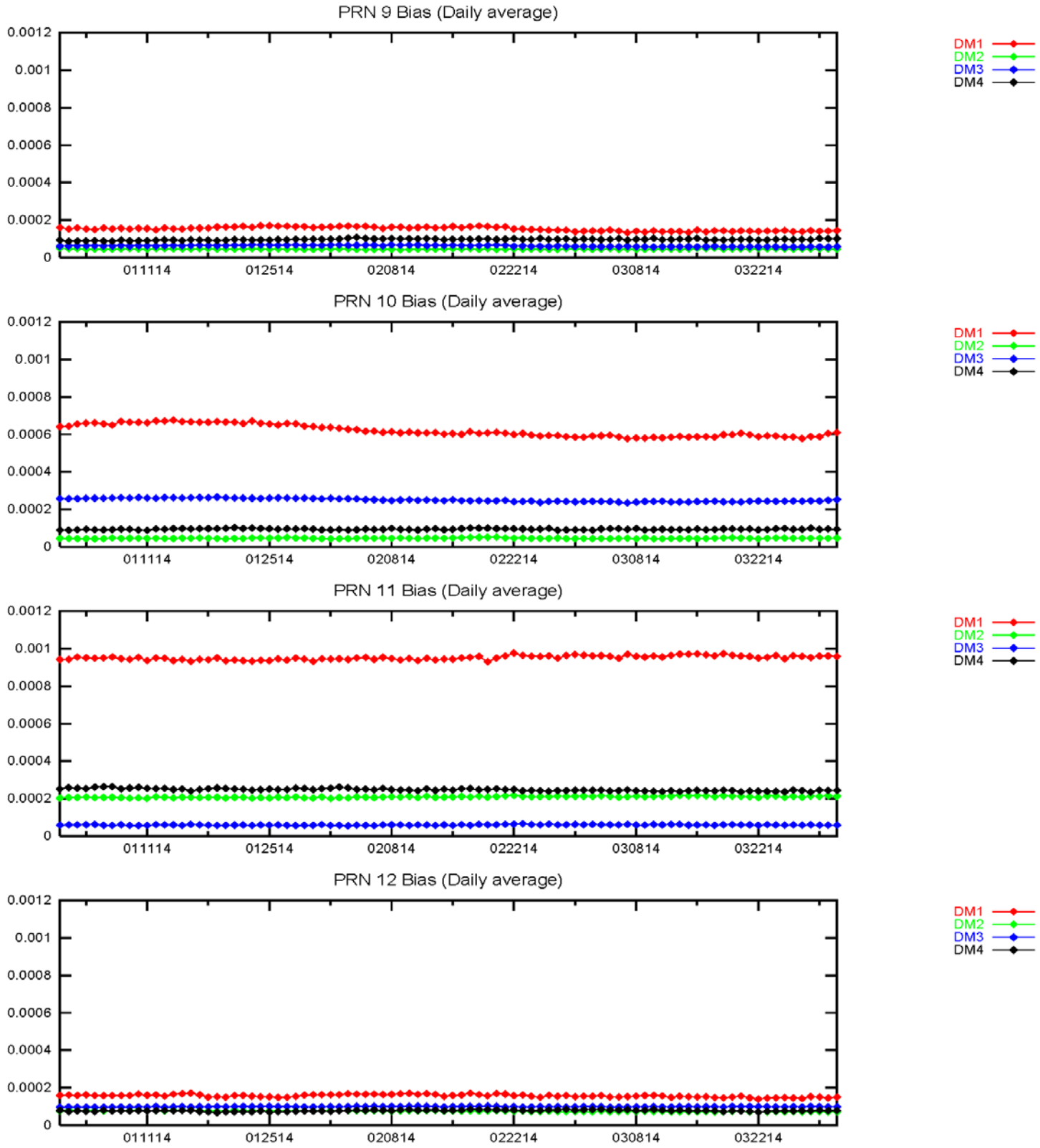


Figure 11-6 PRN Bias Average Trend (PRN 13 – PRN 16)

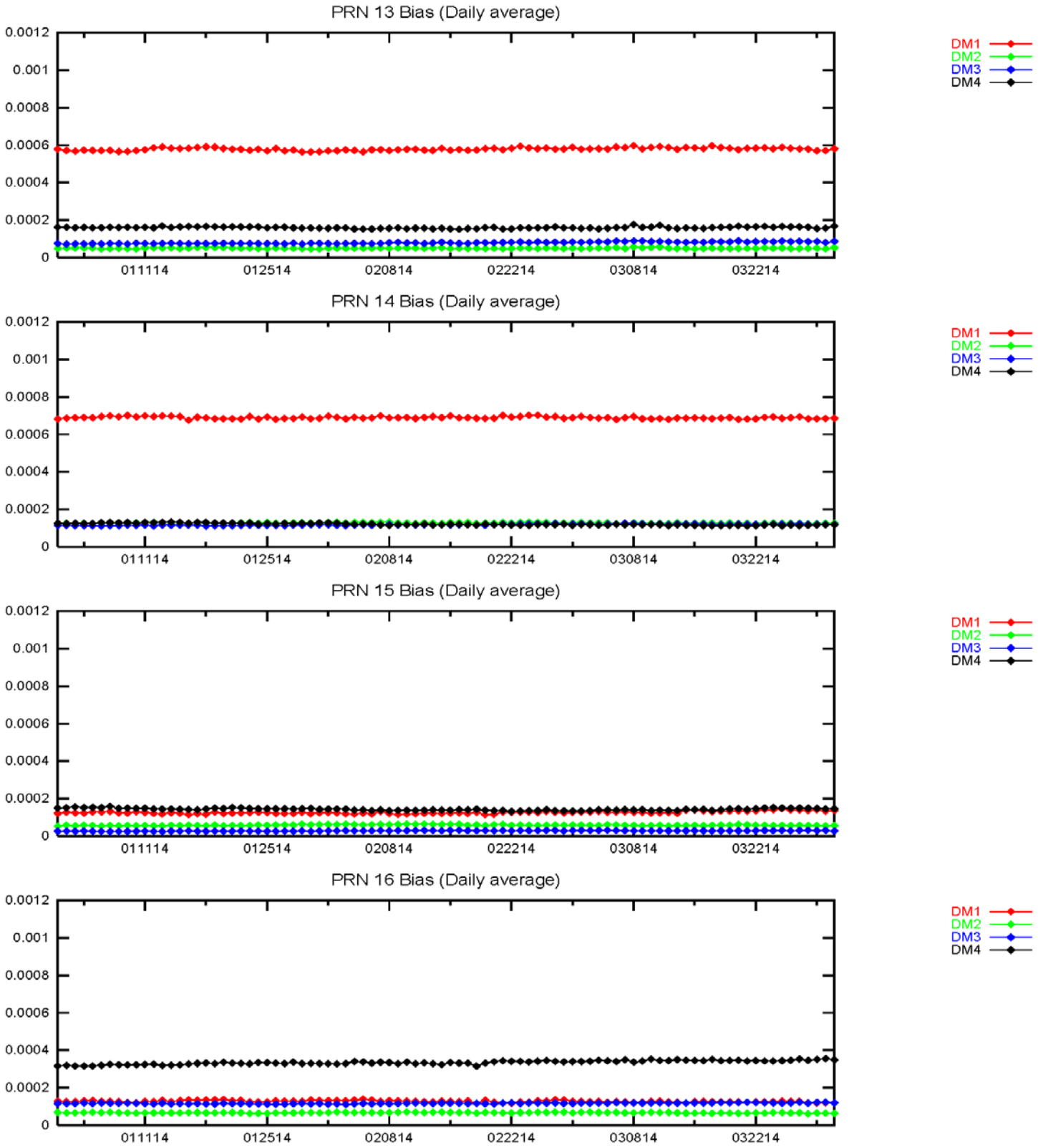


Figure 11-7 PRN Bias Average Trend (PRN 17 – PRN 20)

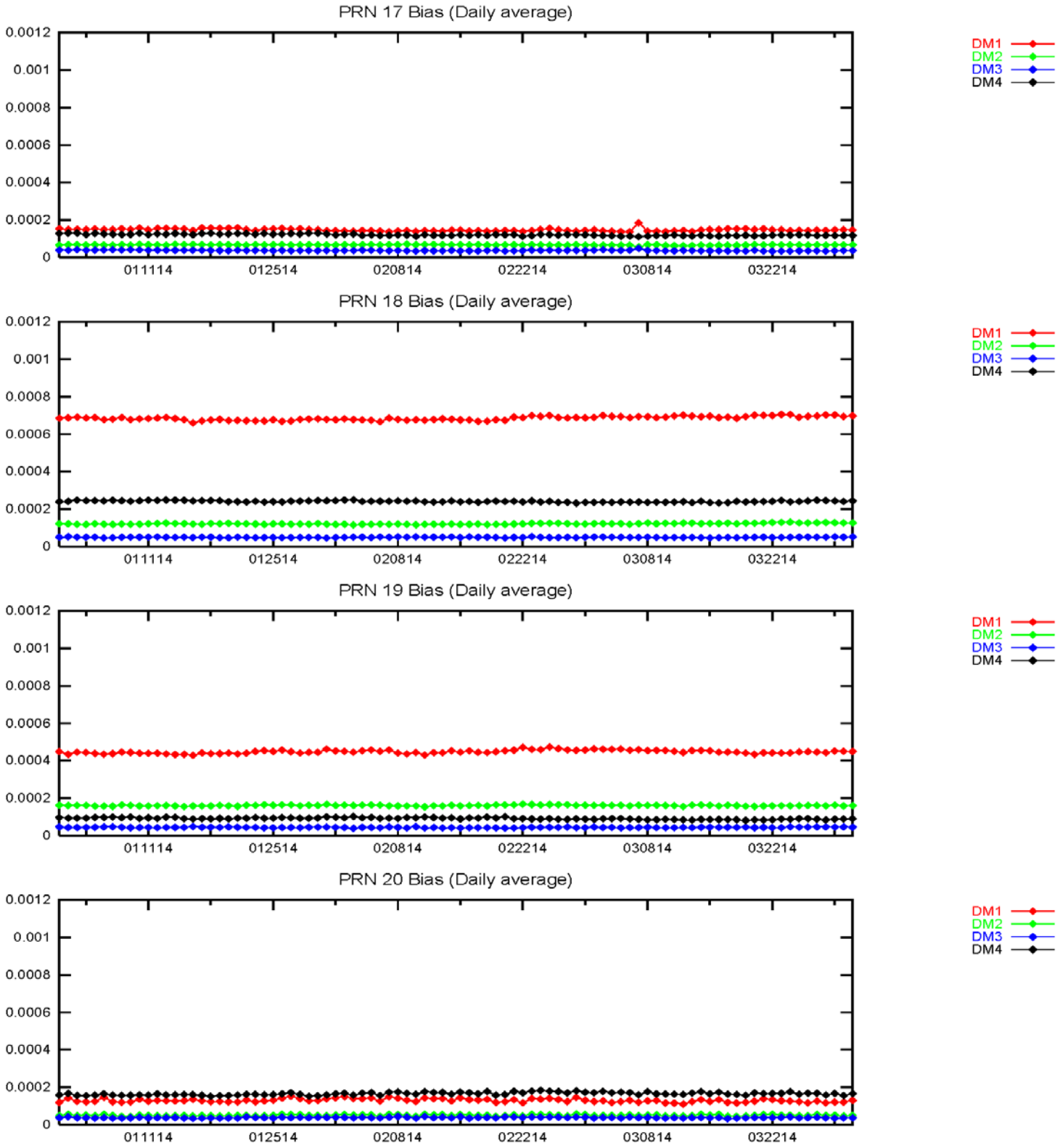


Figure 11-8 PRN Bias Average Trend (PRN 21 – PRN 24)

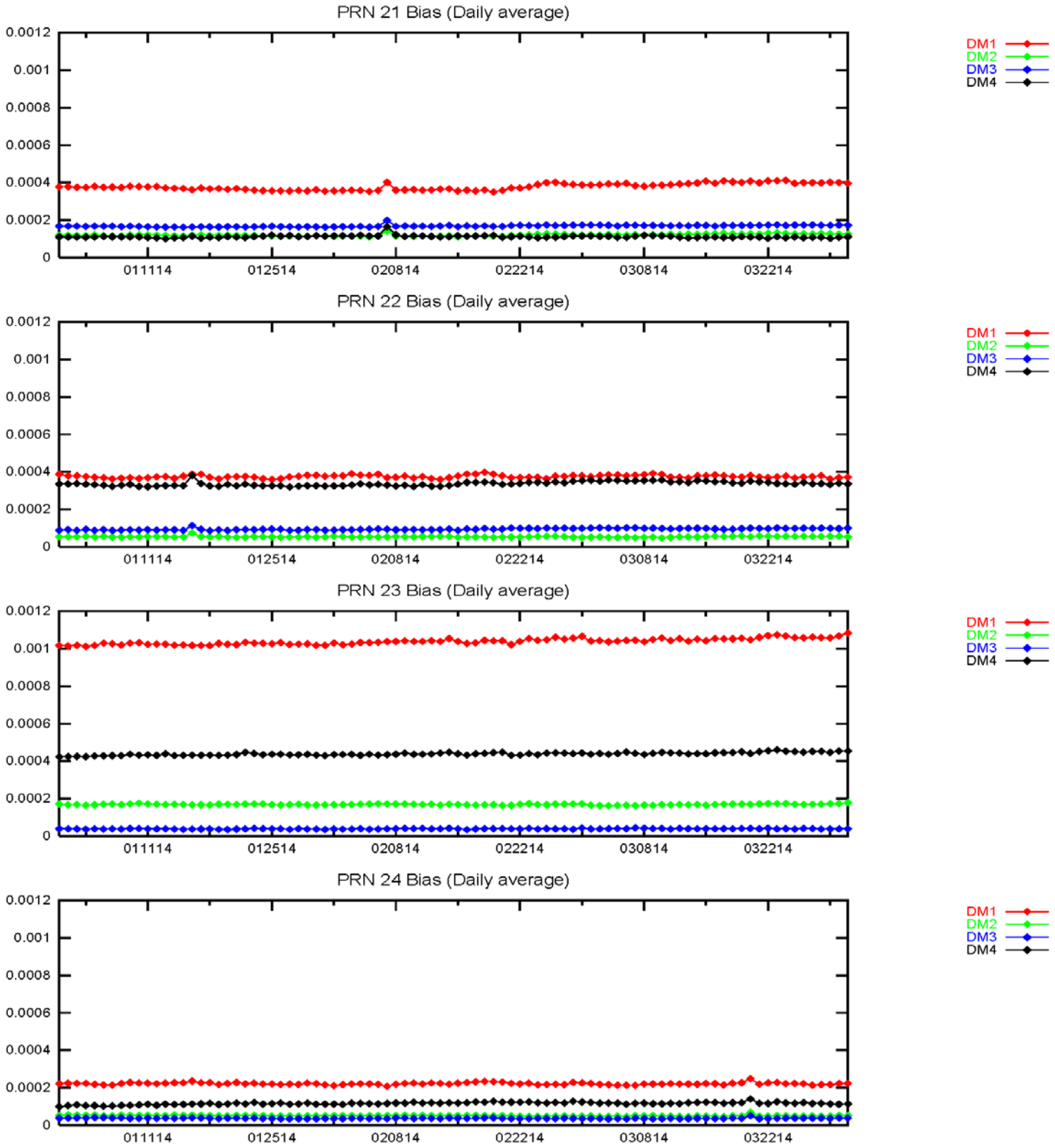


Figure 11-9 PRN Bias Average Trend (PRN 25 – PRN 28)

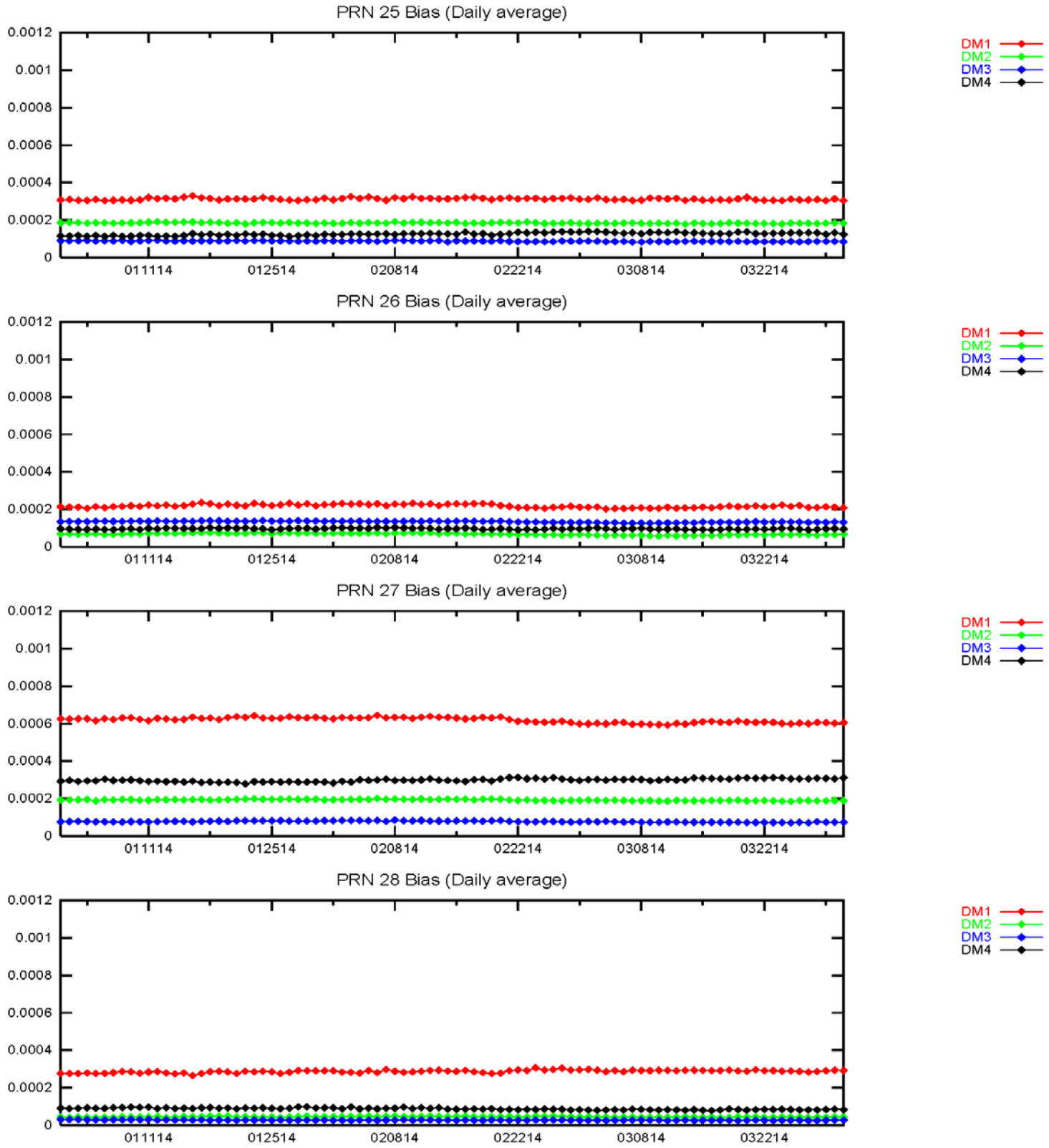
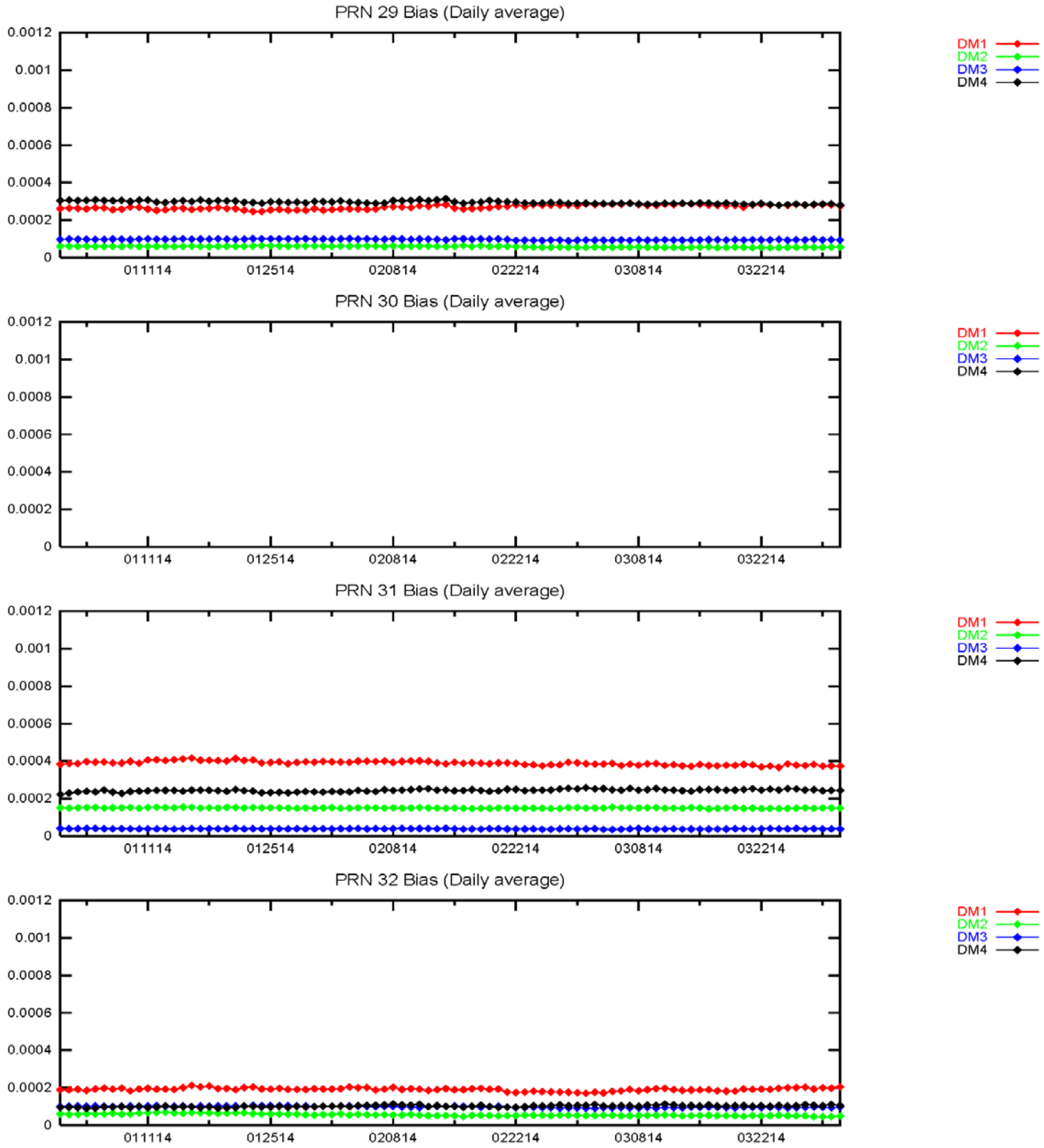


Figure 11-10 PRN Bias Average Trend (PRN 29 – PRN 32)



11.4 SQM Trips

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

12.0 G3 RECEIVER ANALYSIS

The WAAS G3 receiver analysis determines the position and range domain performance of the new Novatel G3 receiver as compared to the currently fielded Novatel G2 receiver. In preparation for a full constellation of dual civil frequency GPS satellites (L1/L5), the WAAS system will be upgraded with new receivers in order to fully recognize the benefit of GPS modernization. The receivers have already undergone extensive factory testing by the manufacturer and the first test receivers were delivered to the Federal Aviation Administration in October 2013. The new receivers were setup at six existing WAAS reference sites (WRS) using the existing antenna subsystems and reference clocks for input. The six sites are:

Nashua, New Hampshire (Boston)	Honolulu, Hawaii
Aurora, Illinois	Miami, Florida
Fairbanks, Alaska	Seattle, Washington

Two Novatel G3 receivers were installed at each site for a total of twelve test receivers. The test receiver navigation error data was collected and 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 once every second for the month of March 2014. The G3 test receivers are marked as 4 and 5, while the fielded G2 receivers are marked 1 and 2 for each site. Receivers 1 and 4 are tied to the same antenna and clock hardware, as are receivers 2 and 5.

12.1 G3 Position Accuracy

Table 12-1 lists the receivers used in the PA analysis. Table 12-2 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. Figures 12-1 to 12-4 show the daily horizontal and vertical 95% accuracy for LPV operational service level for the reporting 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 12-2. The Honolulu site is an exception to the rule because it so far outside CONUS. Honolulu was evaluated solely in NPA mode for all position results.

Table 12-3 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 1.145 meters and 2.078 meters at Miami-A, respectively. The minimum 95% CONUS horizontal and vertical LPV errors are 0.755 meters and 1.024 meters at Chicago-B, respectively.

Table 12-1 PA Evaluation Sites for G3 Receivers

Location	Days Evaluated	Samples
Boston-A	31	2677853
Boston-B	31	2677828
Chicago-A	31	2677586
Chicago-B	31	2677590
Fairbanks-A	26	2205335
Fairbanks-B	26	2205512
Honolulu-A	24	2064872
Honolulu-B	23	2022354
Miami-A	31	2677852
Miami-B	31	2677853
Seattle-A	29	2539164
Seattle-B	29	2539147

Table 12-2 PA 95% Horizontal and Vertical Accuracy for G3 Receivers

Location	Horizontal (HAL = 40m) (Meters)	Horizontal (HAL=556m) (Meters)	Vertical (VAL=50m) (Meters)	Percentage in PA mode (%)
Boston-A	0.892	0.892	1.179	100
Boston-B	0.890	0.890	1.226	100
Chicago-A	0.992	0.992	1.101	100
Chicago-B	0.755	0.755	1.024	100
Fairbanks-A	0.828	0.828	1.619	100
Fairbanks-B	0.882	0.884	1.864	100
Miami-A	1.145	1.145	2.078	100
Miami-B	1.058	1.058	1.706	100
Seattle-A	0.939	0.939	1.048	100
Seattle-B	1.110	1.110	1.062	100
Honolulu-A *	10.816	19.994	-	77.09
Honolulu-B *	11.008	20.085	-	75.51

* Note: Because Honolulu sites are so far outside CONUS, they were evaluated for position in Non-Precision Approach (NPA) mode only. Because NPA mode was used, no vertical accuracy is given. The percentage value for Honolulu is the percent of total time evaluated of March 2014.

Table 12-3 Maximum LPV Error Statistics for G3 Receivers

Location	Horizontal Error (m)	Horizontal Error/HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/VPL	Vertical Maximum Ratio
Boston-A	1.980	0.103	0.130	3.309	0.124	0.144
Boston-B	2.529	0.134	0.149	5.202	0.106	0.173
Chicago-A	2.844	0.216	0.216	4.110	0.222	0.222
Chicago-B	1.987	0.120	0.142	4.897	0.249	0.250
Fairbanks-A	2.500	0.101	0.146	5.006	0.133	0.190
Fairbanks-B	2.544	0.088	0.175	5.528	0.143	0.190
Miami-A	2.474	0.107	0.182	4.607	0.218	0.240
Miami-B	2.388	0.149	0.182	4.387	0.141	0.194
Seattle-A	2.135	0.150	0.193	6.080	0.325	0.325
Seattle-B	2.148	0.188	0.192	4.745	0.145	0.199
Honolulu-A *	23.868	0.166	-	31.581	0.188	-
Honolulu-B *	24.011	0.167	-	31.529	0.186	-

* Note: Because Honolulu sites are so far outside CONUS, they were evaluated for position in Non-Precision Approach (NPA) mode only. Because NPA mode was used, no vertical accuracy is given. The percentage value for Honolulu is the percent of total time evaluated of March 2014.

Figure 12-1 LPV 95% Horizontal Accuracy

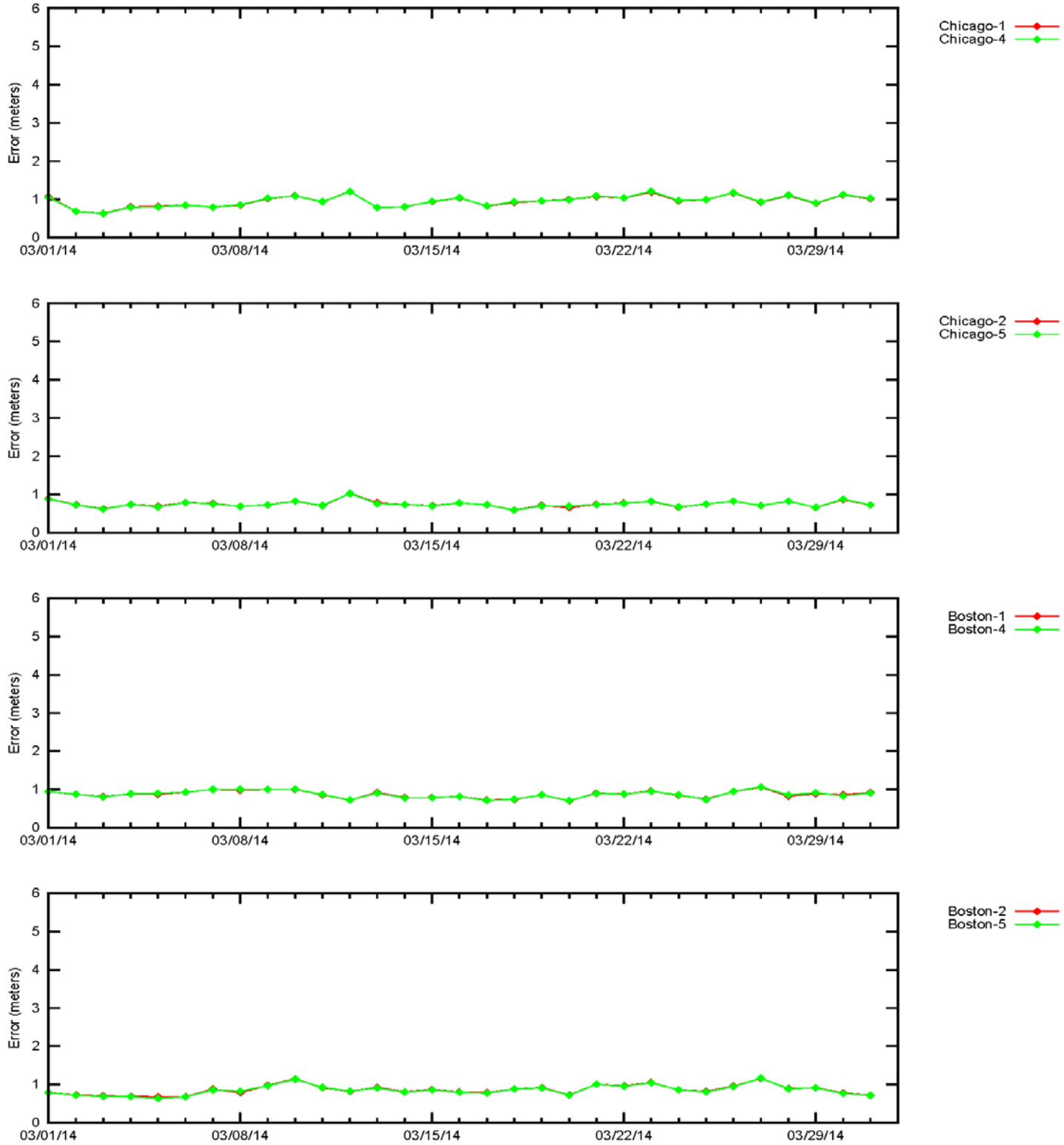


Figure 12-2 LPV 95% Horizontal Accuracy

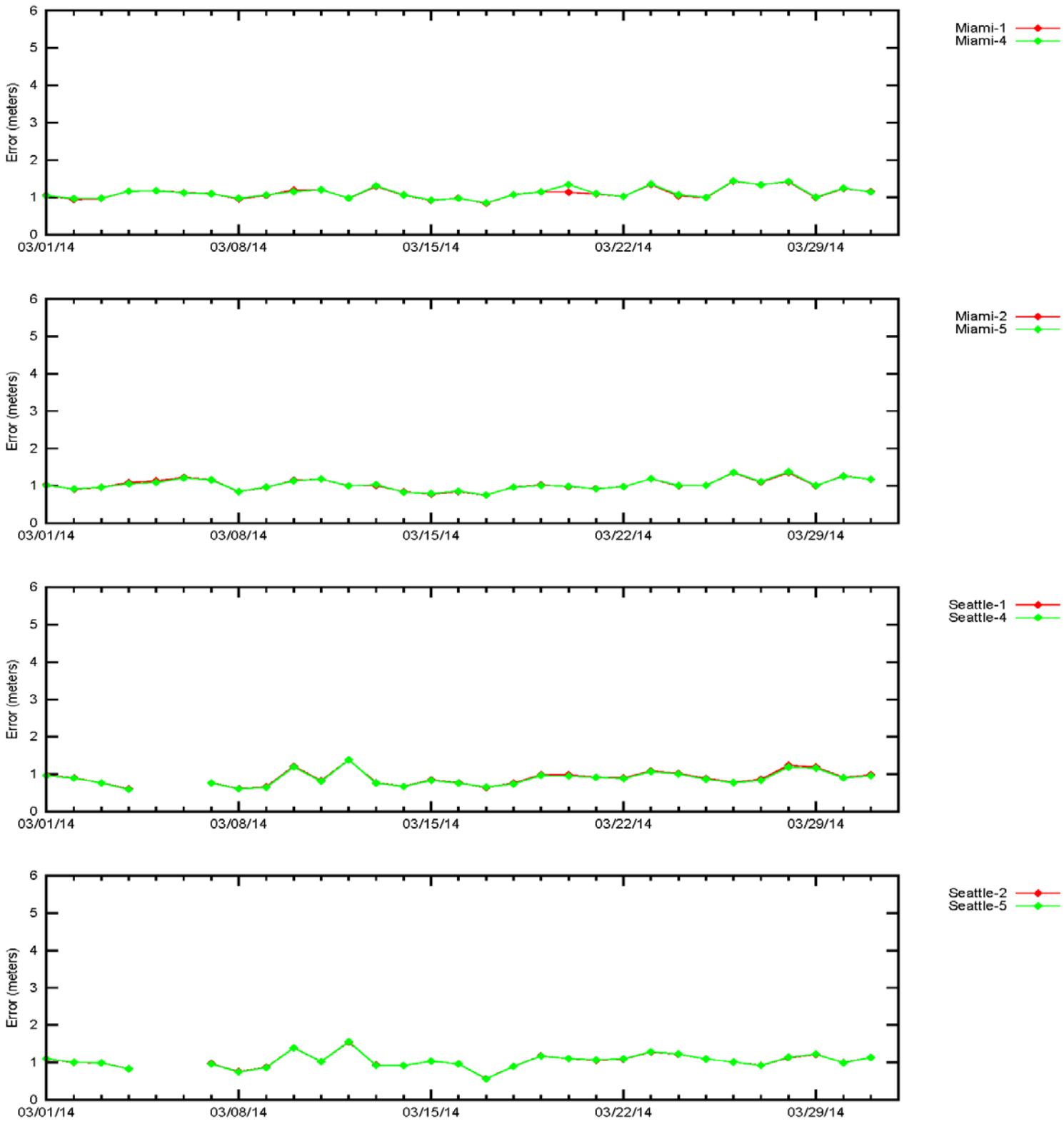


Figure 12-3 LPV 95% Vertical Accuracy

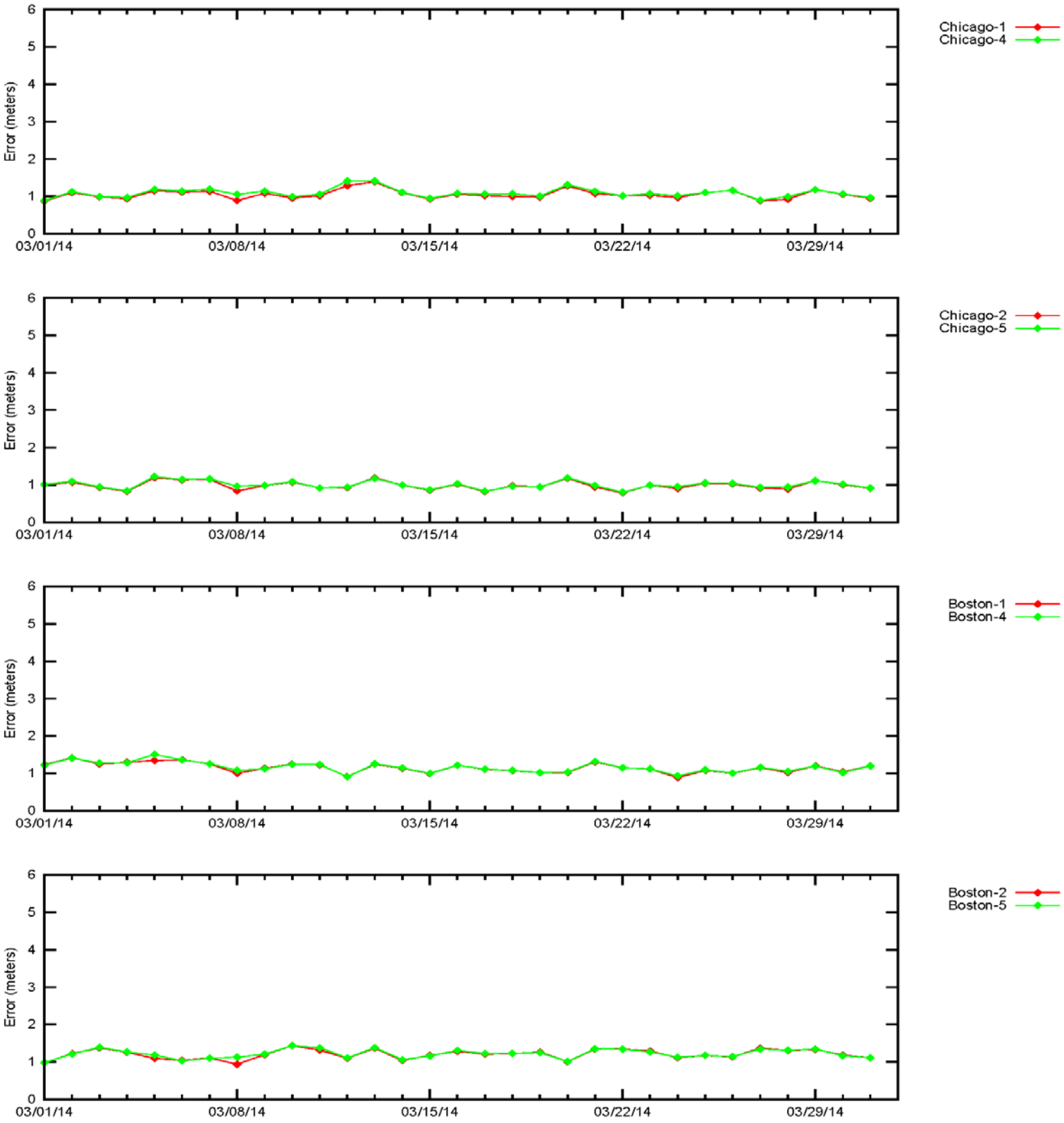


Figure 12-4 LPV 95% Vertical Accuracy

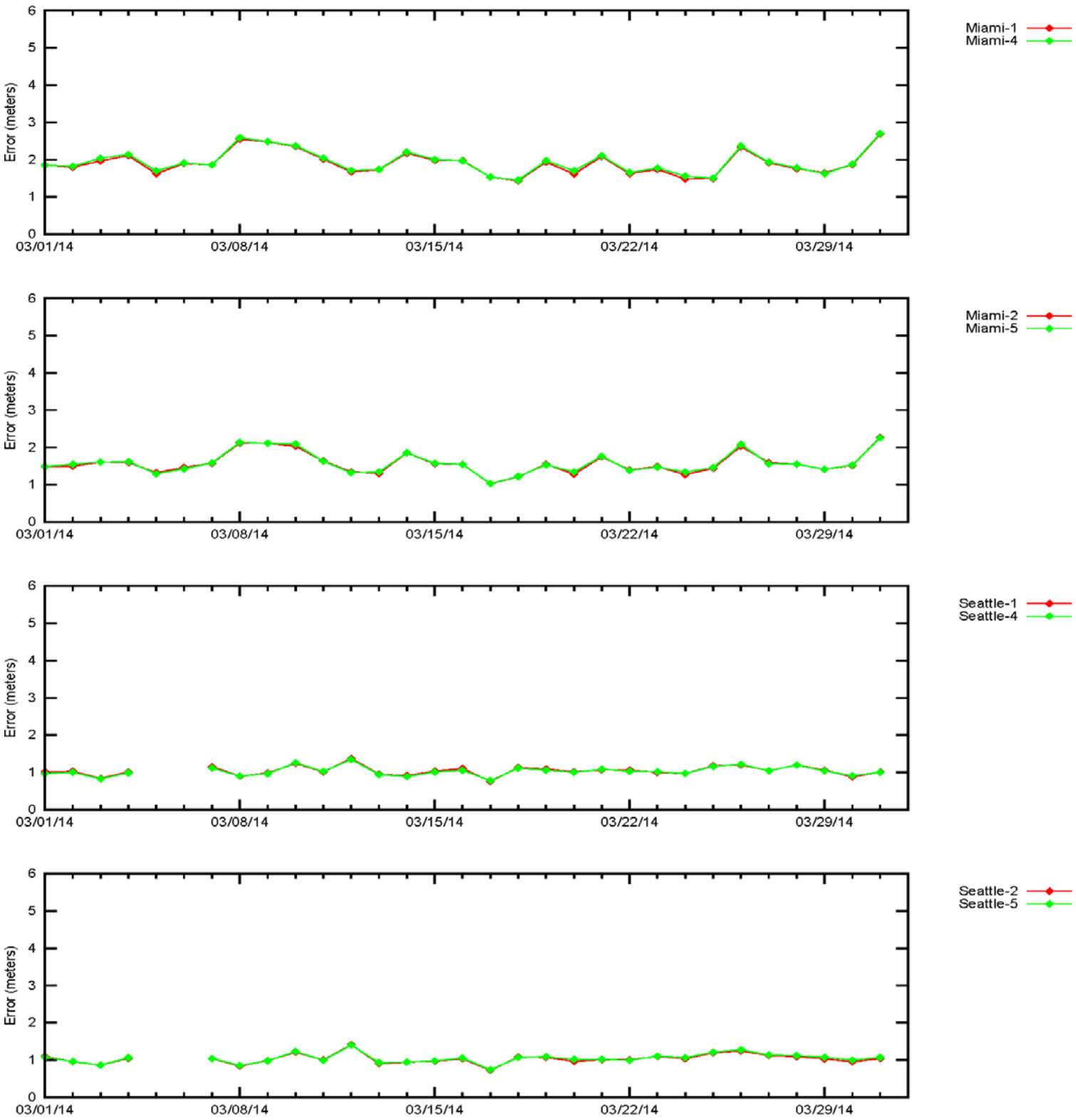


Figure 12-5 LPV Horizontal Error Distribution Histogram

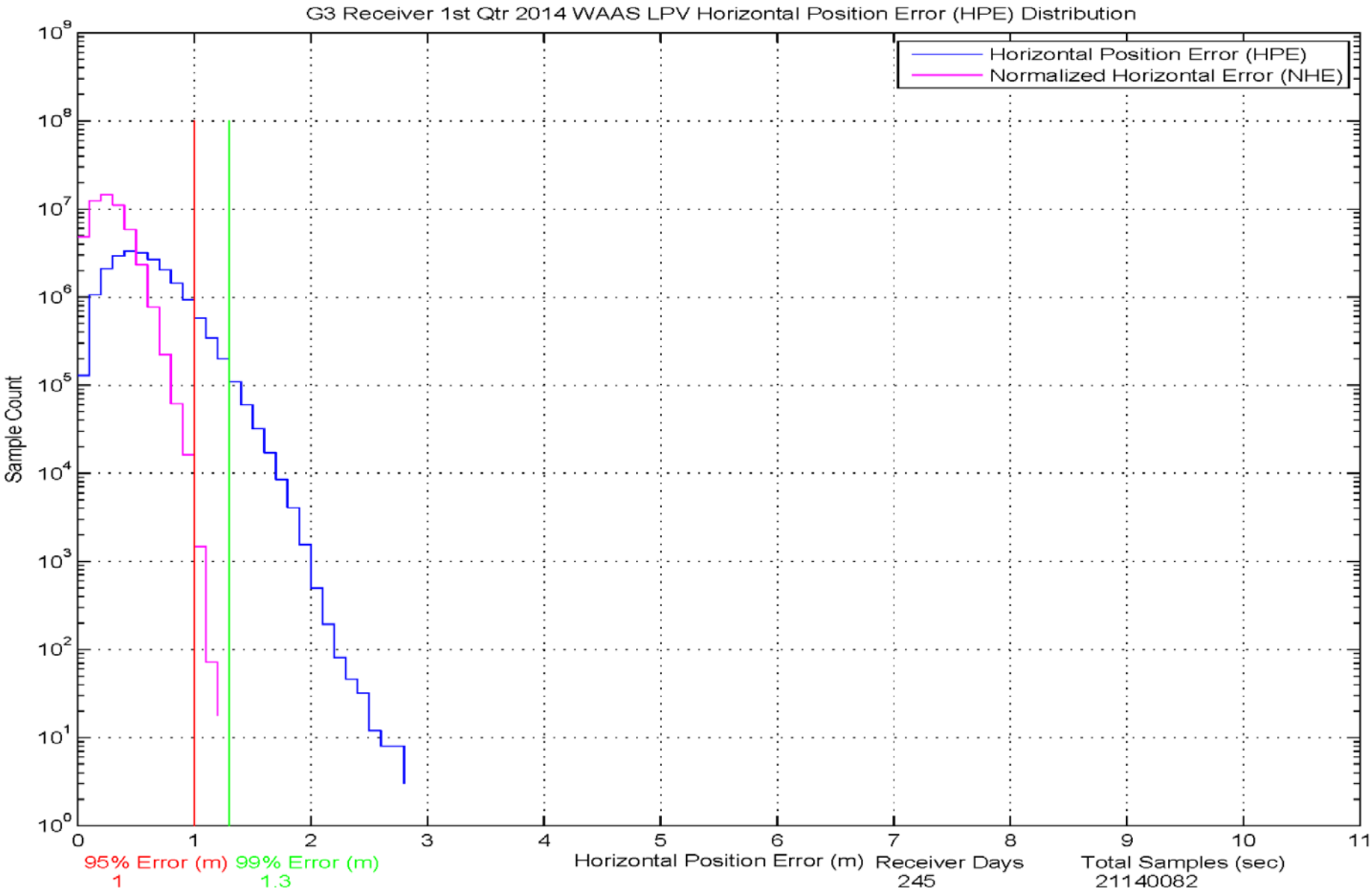


Figure 12-6 LPV Vertical Error Distribution Histogram

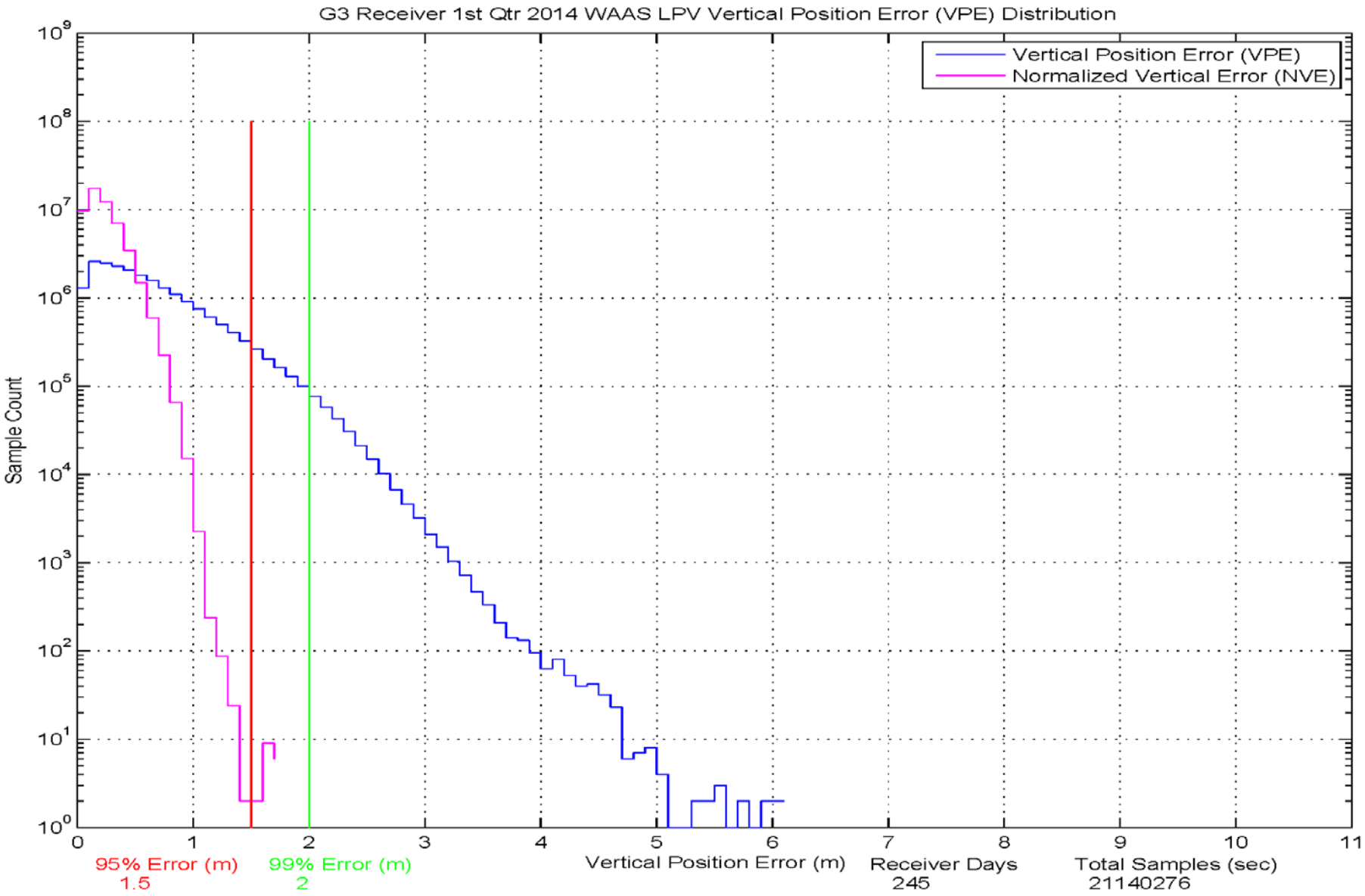


Figure 12-7 LPV 95% Horizontal Error Bounding Triangle Chart

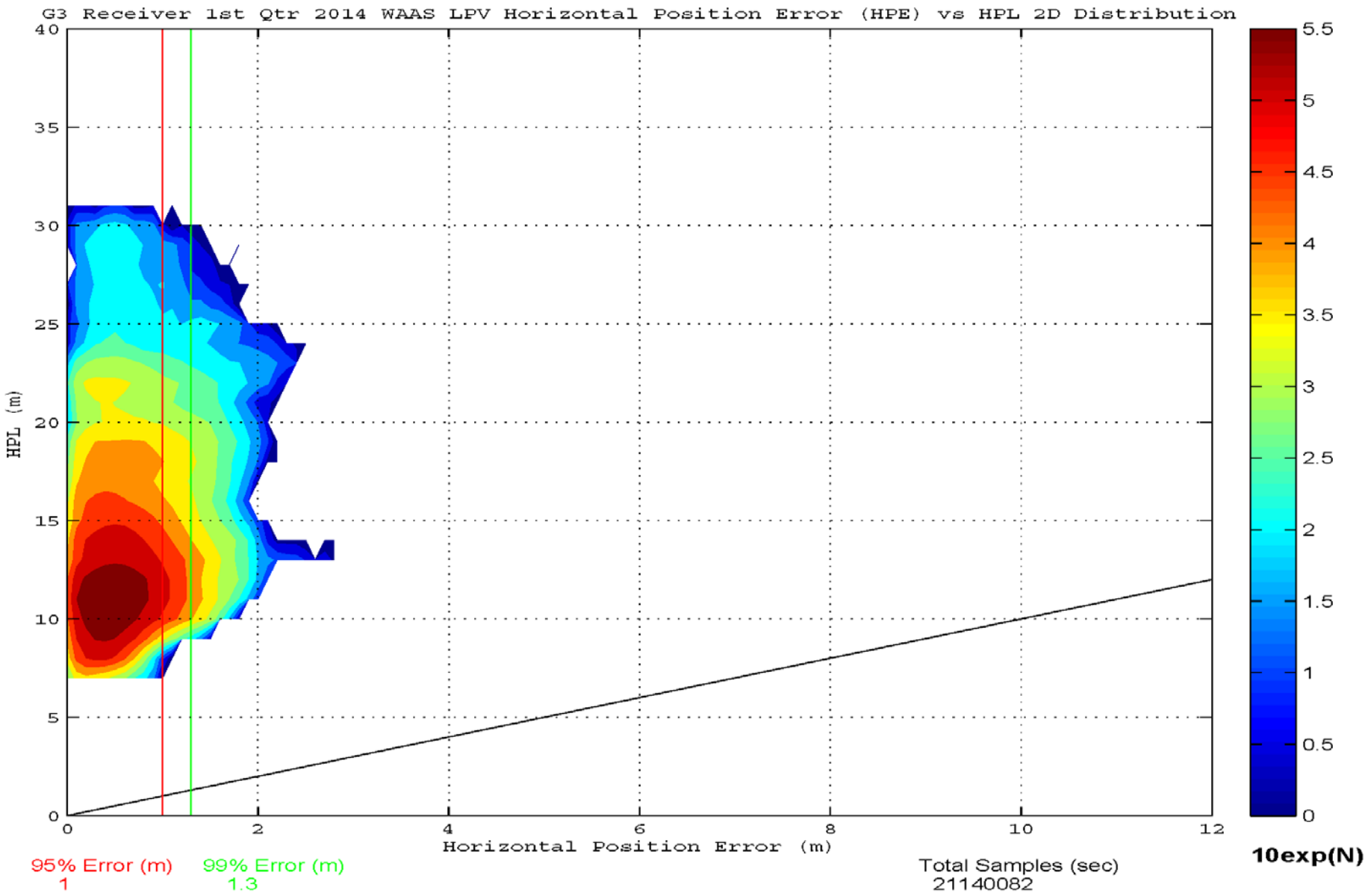
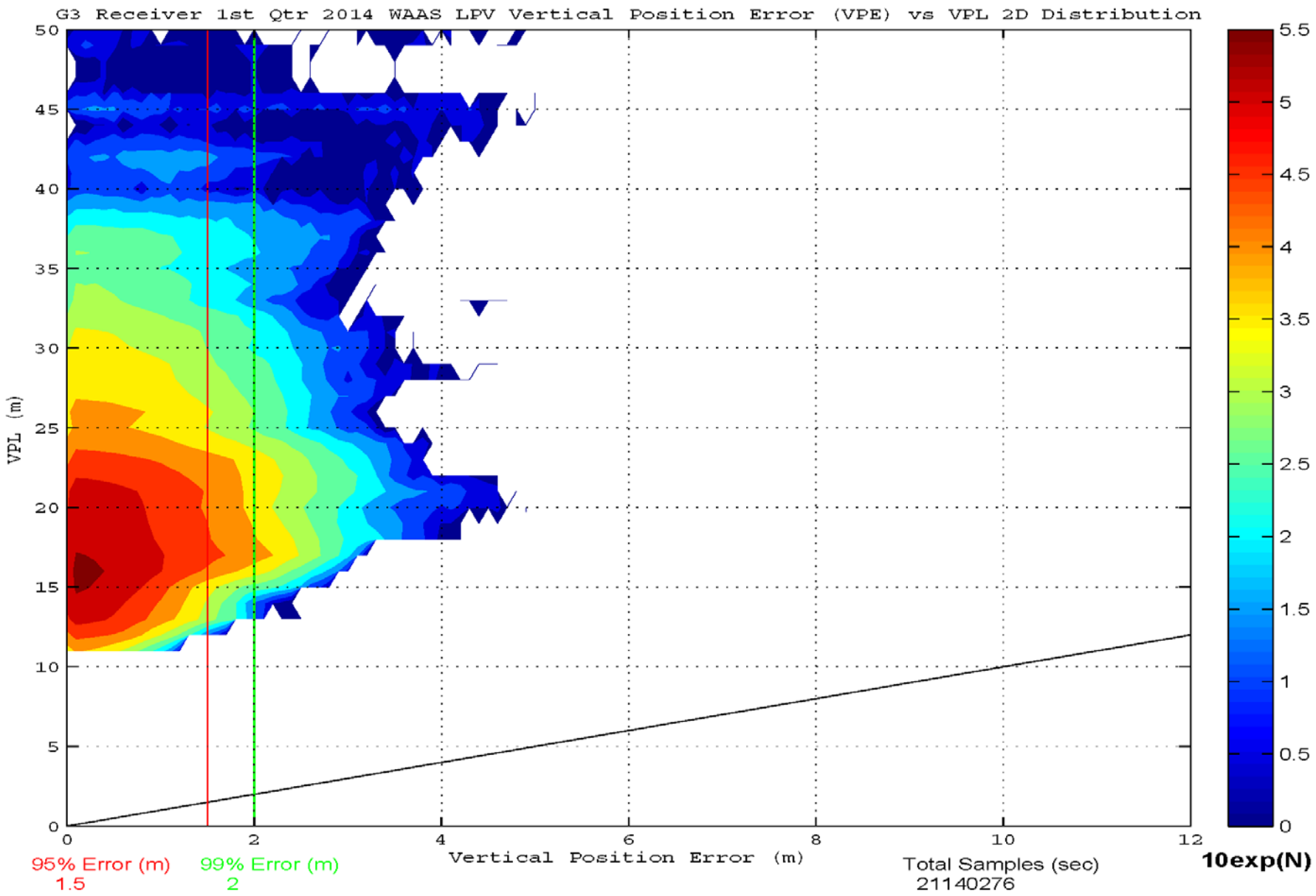


Figure 12-8 LPV 95% Vertical Error Bounding Triangle Chart



12.2 G3 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 the twelve test receivers during the period. Table 12-4 and 12-5 show the range error 95% index and 99.9% (3.29 sigma) bounding statistics for each SV at the selected locations. 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 the twelve test receivers during the period. Table 12-6 and 12-7 show the ionospheric error 95% index and 99.9% (3.29 sigma) bounding statistics for each SV at the test locations.

Table 12-4 Range Error 95% Index and 3.29 Sigma Bounding

Site →	Chicago 4		Chicago 5		Boston 4		Boston 5		Seattle 4		Seattle 5	
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	3.231	100	2.844	100	2.931	100	2.756	100	3.066	99.9968	3.023	100
2	2.728	99.9927	2.562	100	2.210	100	2.233	100	2.439	99.2800	2.502	100
3	1.730	100	1.541	100	0.902	100	1.153	100	1.414	99.7479	1.180	100
4	1.309	100	1.307	100	1.325	100	1.428	100	1.971	99.0303	1.657	100
5	1.729	100	1.821	100	1.712	100	2.010	100	1.346	99.2714	1.550	100
6	-	-	-	-	-	-	-	-	-	-	-	-
7	1.597	100	1.233	100	1.807	100	1.646	100	1.487	99.9910	1.166	100
8	1.112	100	1.228	100	1.569	100	1.751	100	1.019	100	1.224	100
9	1.635	100	1.306	100	1.441	100	1.525	100	0.845	100	1.208	100
10	1.159	100	0.774	100	1.129	100	0.909	100	0.933	100	0.923	100
11	1.795	100	1.308	100	1.934	100	1.357	100	1.811	100	1.318	100
12	0.964	100	1.176	100	1.033	100	2.206	100	1.686	99.2882	1.169	100
13	1.174	100	0.989	100	1.193	100	1.454	100	0.792	100	1.186	100
14	1.259	100	0.984	100	0.989	100	0.910	100	1.233	100	0.937	100
15	1.349	100	1.567	100	1.623	100	1.931	100	1.368	99.9989	1.214	100
16	2.191	100	1.819	100	1.076	100	1.177	100	1.251	100	1.884	100
17	1.004	100	0.947	100	1.388	100	1.019	100	1.060	99.2833	1.282	100
18	1.409	100	1.185	100	1.211	100	1.111	100	1.068	100	1.500	100
19	3.130	100	2.235	100	3.127	100	2.768	100	2.534	100	2.078	100
20	1.262	100	1.517	100	1.284	100	1.212	100	1.375	100	1.242	100
21	1.015	100	1.214	100	1.453	100	1.194	100	1.527	99.2572	1.202	100
22	2.298	100	1.922	100	2.256	100	2.112	100	2.258	99.9246	2.273	100
23	1.915	100	1.917	100	2.205	100	1.822	100	1.863	100	1.856	100
24	2.751	100	2.736	100	2.804	100	2.983	100	2.573	99.0510	3.135	99.9999
25	2.852	100	1.894	100	2.080	100	2.167	100	2.227	99.2725	2.171	100
26	1.443	100	1.376	100	1.666	100	2.118	100	1.912	99.9614	1.083	100
27	2.806	100	2.198	100	2.223	100	2.484	100	2.693	99.6027	2.228	100
28	1.258	100	1.388	100	1.708	100	1.793	100	1.170	99.7089	1.624	100
29	1.268	100	1.303	100	1.303	100	1.794	100	1.573	98.6508	1.759	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	1.187	100	2.803	100	0.836	100	0.740	100	1.377	100	1.243	100
32	1.005	100	0.837	100	1.038	100	0.926	100	0.994	100	0.882	100
135	2.576	100	1.615	100	2.118	100	1.919	100	1.670	100	1.659	100
138	2.504	100	1.856	100	1.514	100	1.632	100	1.848	100	1.502	100

Table 12-5 Range Error 95% Index and 3.29 Sigma Bounding

Site →	Miami 4		Miami 5		Fairbanks 4		Fairbanks 5	
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(%)
1	2.215	100	2.895	100	3.999	100	3.729	99.9578
2	2.964	100	3.009	100	3.619	99.9983	4.095	99.9917
3	1.394	100	1.282	100	2.503	100	2.641	100
4	1.439	100	1.570	100	2.571	100	2.688	100
5	1.412	100	2.187	100	2.858	100	2.700	100
6	-	-	-	-	-	-	-	-
7	2.096	100	1.386	100	2.688	100	2.607	100
8	1.104	100	1.423	100	2.553	100	2.600	100
9	1.269	100	1.230	100	2.618	100	2.657	100
10	1.572	100	1.464	100	2.472	100	2.546	100
11	2.456	100	2.153	100	3.059	100	2.989	100
12	0.901	100	1.227	100	2.693	100	2.687	100
13	1.580	100	0.926	100	2.468	100	2.703	100
14	1.453	100	1.175	100	2.684	100	2.963	100
15	1.493	100	1.895	100	2.549	100	2.737	100
16	1.626	100	1.960	100	2.503	100	3.001	99.9966
17	1.439	100	1.196	100	2.420	100	2.723	100
18	1.354	100	1.565	100	3.025	100	3.464	100
19	3.429	100	3.158	100	4.081	99.9738	4.241	99.9593
20	1.862	100	1.824	100	2.890	100	2.821	100
21	2.196	100	2.050	100	1.936	100	3.390	100
22	2.418	100	2.779	99.9935	4.013	100	3.989	100
23	2.499	100	2.525	100	3.317	100	3.360	100
24	2.654	100	3.054	100	4.122	99.9956	3.786	99.9812
25	2.047	100	1.864	100	3.474	100	3.251	100
26	1.241	100	1.392	100	2.460	100	2.738	100
27	1.520	100	2.320	100	3.290	100	3.257	99.9984
28	2.942	100	1.900	100	2.932	100	2.942	100
29	1.474	100	1.412	100	2.903	100	2.844	100
30	-	-	-	-	-	-	-	-
31	1.275	100	1.803	100	2.616	100	2.717	100
32	1.082	100	1.329	100	2.653	100	2.545	100
135	1.410	100	2.727	100	4.160	100	4.863	100
138	2.441	100	1.675	100	4.428	100	4.237	100

Table 12-6 Ionospheric Error 95% Index and 3.29 Sigma Bounding

Site →	Chicago 4		Chicago 5		Boston 4		Boston 5		Seattle 4		Seattle 5	
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	2.238	100	2.082	100	2.324	100	2.219	100	1.936	100	1.855	100
2	1.837	100	1.994	100	1.749	100	1.753	100	1.795	100	1.893	100
3	1.083	100	0.936	100	0.649	100	0.801	100	0.694	100	0.668	100
4	1.025	100	1.033	100	1.299	100	1.372	100	1.334	100	1.025	100
5	1.000	100	1.267	100	1.119	100	1.282	100	0.558	100	0.707	100
6	-	-	-	-	-	-	-	-	-	-	-	-
7	0.867	100	0.678	100	0.840	100	0.815	100	1.167	100	0.771	100
8	0.651	100	0.634	100	0.724	100	0.740	100	0.673	100	0.678	100
9	0.836	100	0.747	100	0.731	100	0.654	100	0.628	100	0.770	100
10	0.531	100	0.525	100	0.724	100	0.535	100	0.428	100	0.479	100
11	0.641	100	0.531	100	0.577	100	0.530	100	0.965	100	0.770	100
12	0.629	100	0.676	100	0.634	100	1.032	100	0.763	100	0.763	100
13	0.598	100	0.494	100	0.567	100	0.693	100	0.526	100	0.668	100
14	0.503	100	0.559	100	0.459	100	0.424	100	0.823	100	0.577	100
15	0.835	100	0.937	100	0.894	100	1.041	100	0.760	100	0.796	100
16	0.641	100	0.614	100	0.667	100	0.415	100	0.845	100	0.988	100
17	0.854	100	0.686	100	0.984	100	0.697	100	0.699	100	0.668	100
18	0.860	100	0.771	100	0.974	100	0.877	100	0.741	100	0.981	100
19	1.639	100	1.511	100	1.668	100	1.626	100	1.974	100	1.706	100
20	0.485	100	0.535	100	0.530	100	0.471	100	0.789	100	0.671	100
21	0.646	100	0.824	100	1.391	100	1.288	100	0.904	100	0.860	100
22	1.721	100	1.625	100	1.764	100	1.666	100	1.865	100	1.846	100
23	1.271	100	1.206	100	1.351	100	0.996	100	1.345	100	1.377	100
24	1.874	100	1.865	100	1.896	100	1.825	100	1.716	100	2.067	100
25	1.471	100	1.347	100	1.255	100	1.400	100	1.476	100	1.461	100
26	0.807	100	0.826	100	0.923	100	1.040	100	1.122	100	0.668	100
27	1.802	100	1.713	100	1.552	100	1.722	100	1.679	100	1.376	100
28	0.497	100	0.663	100	0.851	100	0.727	100	0.687	100	0.835	100
29	0.847	100	0.771	100	0.693	100	0.833	100	0.822	100	0.860	100
30	-	-	-	-	-	-	-	-	-	-	-	-
31	0.834	100	1.685	100	0.469	100	0.640	100	0.772	100	0.696	100
32	0.513	100	0.390	100	0.410	100	0.480	100	0.453	100	0.463	100

Table 12-7 Ionospheric Error 95% Index and 3.29 Sigma Bounding

Site →	Miami 4		Miami 5		Fairbanks 4		Fairbanks 5	
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(%)
1	1.873	100	2.228	100	2.340	97.9681	2.351	97.8250
2	1.510	100	1.858	100	1.950	100	2.188	99.2036
3	0.829	100	0.811	100	1.337	100	1.479	100
4	0.935	100	1.687	100	1.483	100	1.532	100
5	1.029	100	1.477	100	1.487	100	1.405	100
6	-	-	-	-	-	-	-	-
7	1.170	100	0.805	100	1.713	100	1.562	100
8	0.817	100	0.631	100	1.629	100	1.732	100
9	0.856	100	0.833	100	1.820	100	1.667	100
10	0.437	100	0.595	100	1.455	100	1.388	100
11	0.872	100	0.800	100	1.478	100	1.547	100
12	0.761	100	0.782	100	1.690	100	1.559	100
13	0.885	100	0.675	100	1.787	100	1.663	100
14	0.581	100	0.562	100	1.553	100	1.490	100
15	0.903	100	0.938	100	1.537	100	1.601	100
16	1.031	100	1.158	100	1.477	100	1.540	100
17	0.736	100	0.578	100	1.445	100	1.627	100
18	0.708	100	0.990	100	1.487	100	1.718	100
19	1.672	100	1.767	100	2.031	99.4929	2.145	99.2617
20	0.965	100	0.954	100	1.449	100	1.527	100
21	1.226	100	1.215	100	1.351	100	2.002	100
22	1.703	100	2.273	100	2.115	100	2.150	98.9025
23	1.752	100	1.902	100	1.670	100	1.927	99.6032
24	1.887	100	1.918	100	2.325	98.0058	2.220	98.7542
25	1.611	100	1.227	100	2.036	97.9991	1.966	99.0724
26	0.749	100	0.895	100	1.705	100	1.533	100
27	1.426	100	1.705	100	1.828	98.9965	1.778	99.4503
28	1.598	100	0.887	100	1.708	100	1.594	100
29	1.079	100	0.923	100	1.574	100	1.898	99.9975
30	-	-	-	-	-	-	-	-
31	1.125	100	0.888	100	1.344	100	1.572	100
32	0.716	100	0.740	100	1.683	100	1.868	100

Appendix A: Glossary

General Terms and Definitions

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

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

C&V. The Correction and Verification Subsystem.

CONUS. Continental United States.

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

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

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

DR. Discrepancy Report

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

GEO. Geostationary Satellite.

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

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

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

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

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

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

IGS. International GPS Service.

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

LNAV. Lateral Navigation.

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

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

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

MOPS. Minimum Operational Performance Standards.

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

Navigation Message. Message structure designed to carry navigation data.

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

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

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

RFI. Radio Frequency Interference.

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

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

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

SV. Space Vehicle.

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

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

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

VNAV. Vertical Navigation.

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

Appendix B: Additional Coverage Plots

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

Figure B-1 98% CONUS LP Availability Contour

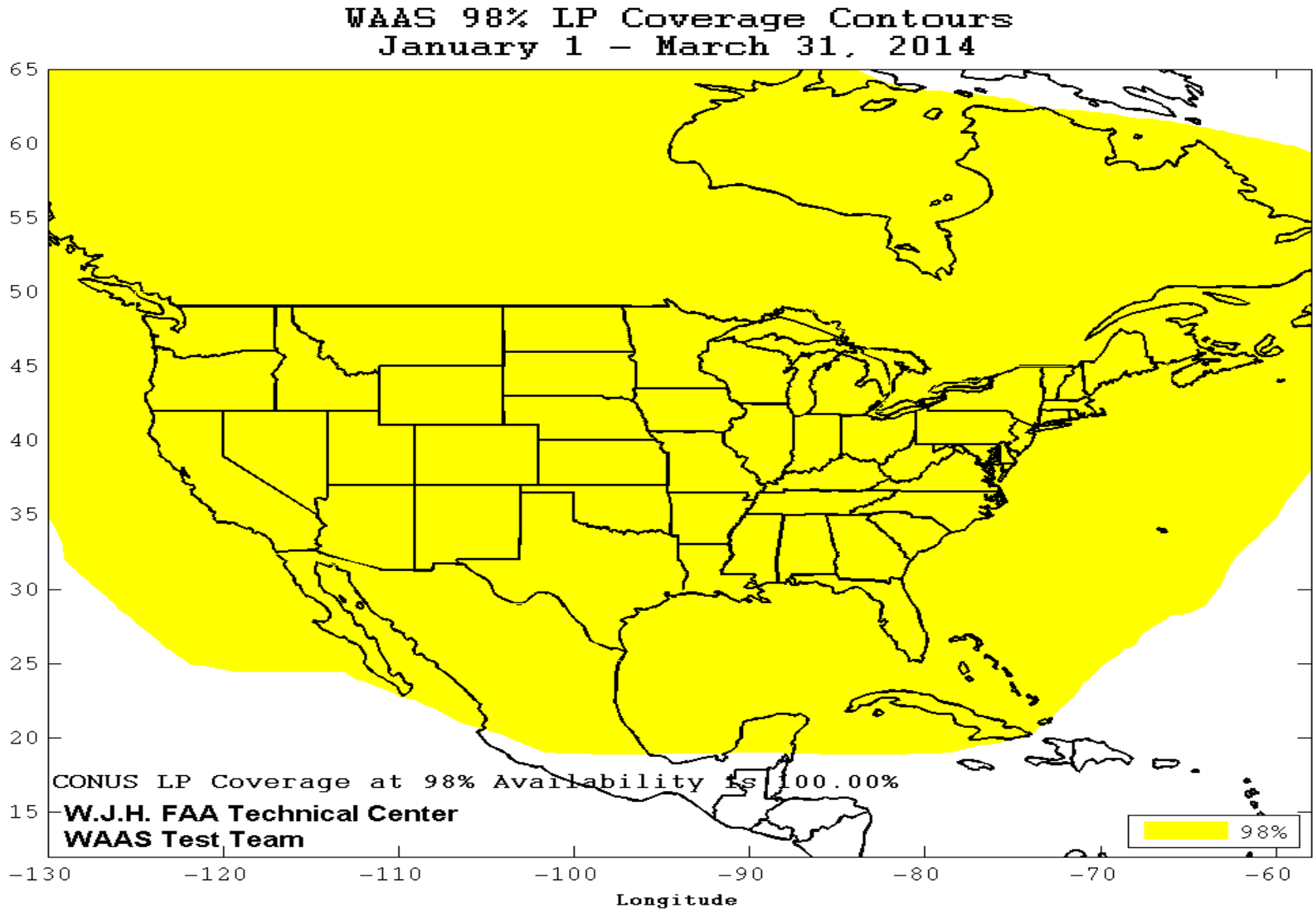


Figure B-2 98% Alaska LP Availability Contour

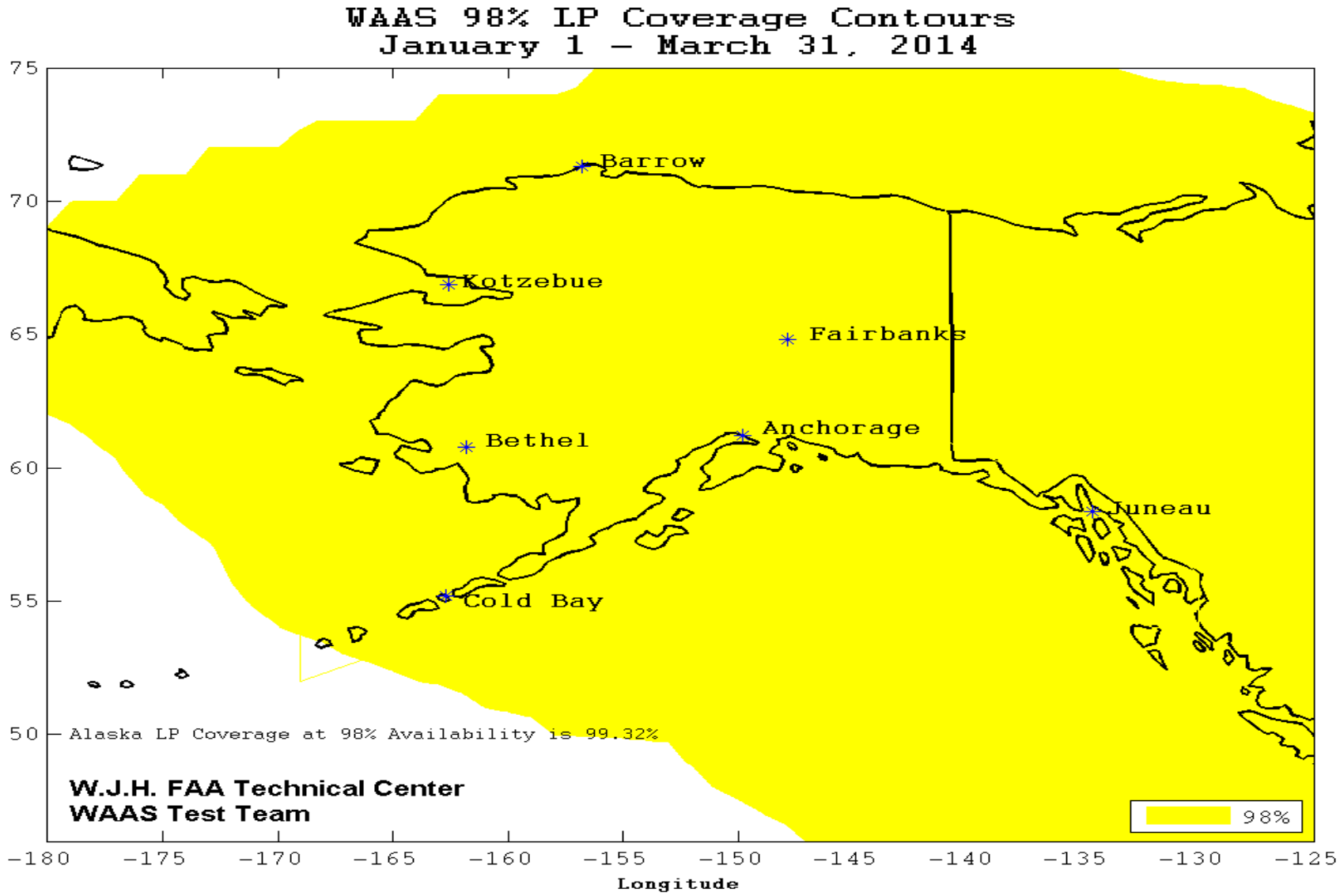


Figure B-3 98% CONUS LPV Availability Contour

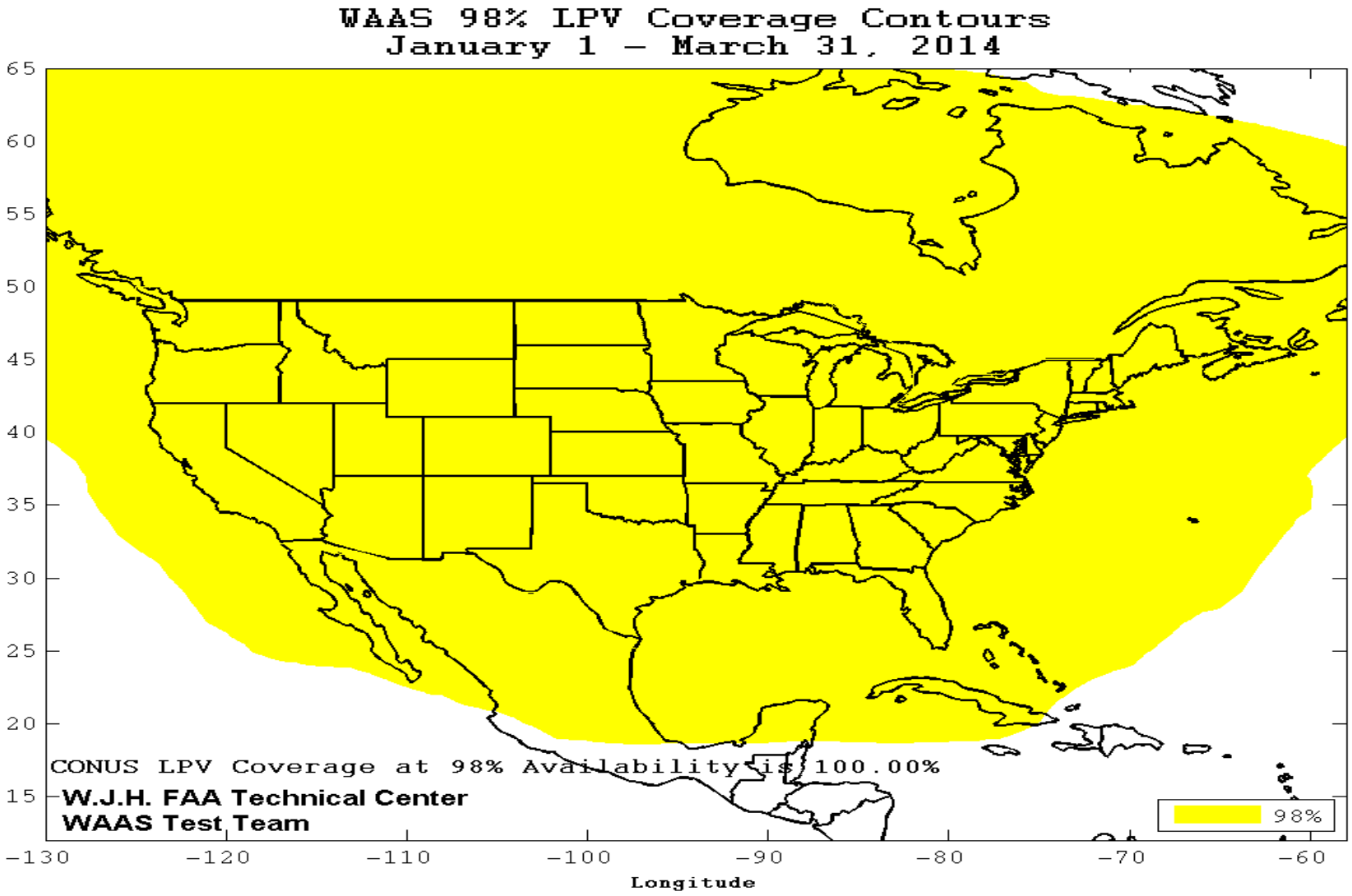


Figure B-4 98% Alaska LPV Availability Contour

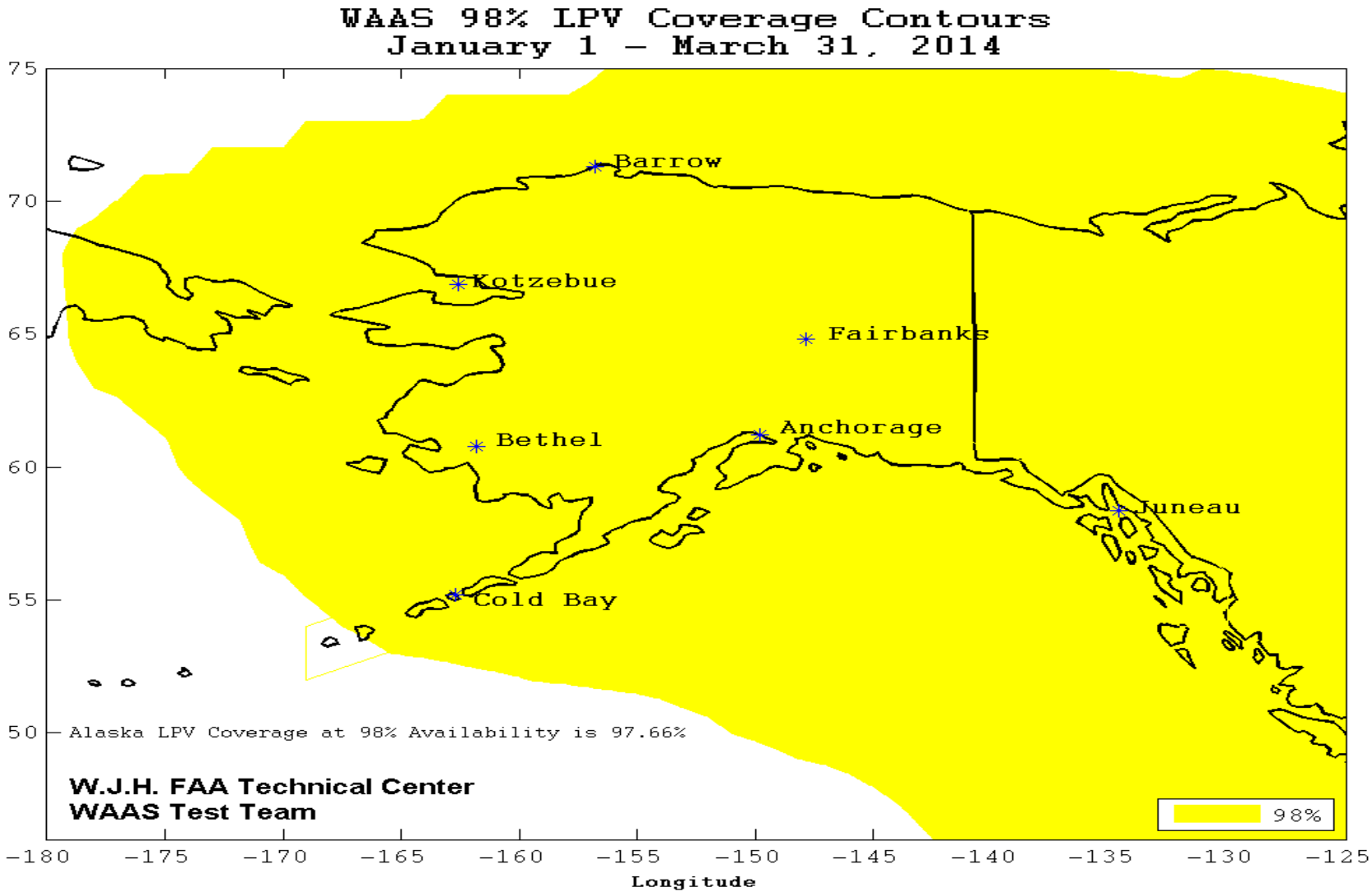


Figure B-5 99% CONUS LPV 200 Availability Contour

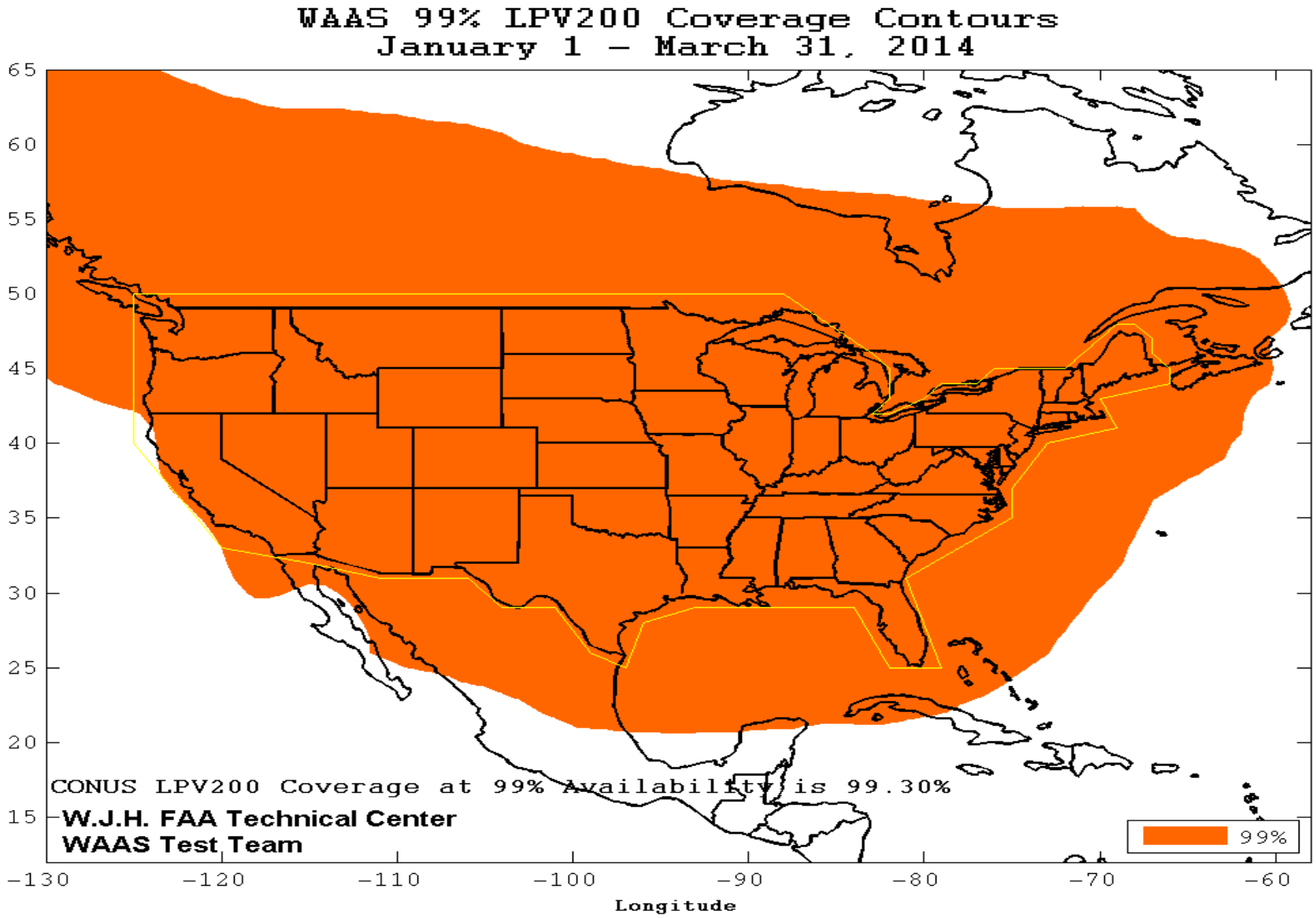


Figure B-6 99% Alaska LPV 200 Availability Contour