WIDE-AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #44

(Revised on 4/30/2014)

Reporting Period: January 1 to March 31, 2013

April 2013

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

Report: **WAAS PAN Report #44**
Revision: **1**
Revision Date: **4/30/2014**

Changes:

Table 8.1 is updated to exclude statistics of April 1st that was included in the previous report by mistake.

Executive Summary

Since 1999 the WAAS Test Team at the William J. Hughes Technical Center has reported GPS performance as measured against the GPS Standard Positioning Service (SPS) Signal Specification. These quarterly reports are known as the PAN (Performance Analysis Network) Report. In addition to that report, the WAAS Test Team reports on the performance of the Wide-Area Augmentation System (WAAS). This report, #44, covers WAAS performance during the period from January 1, 2013 to March 31, 2013.

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

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Atlantic City 1.366 meters	Oakland 0.61 meters	Barrow 0.666 meters	Fairbanks 0.576 meters
95% Vertical Accuracy (VPL <= 50 meters)	Miami 1.767 meters	Denver 0.777 meters	Barrow 1.358 meters	Bethel 0.931 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Washington D.C. 99.99%	Multiple Sites 100%	Multiple Sites 100%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Multiple Sites100%	Arcata 99.78%	Multiple Sites100%	Barrow 99.97%
LPV 200 Availability (HPL <= 40 meters & VPL < =35 meters)	Multiple Sites 100%	Arcata 98.35%	Multiple Sites 100%	Cold Bay 94.46%
99% HPL	Miami 19.663 meters	Memphis 10.766 meters	Cold Bay 28.434 meters	Fairbanks 13.577 meters
99% VPL	Arcata 35.743 meters	Chicago 17.976 meters	Cold Bay 37.722 meters	Juneau 22.413 meters

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDIX

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	78	6715346
Atlantic City	87	7487855
Grand Forks	90	7735292
Oklahoma City	76	6591464
WAAS:		
Albuquerque	90	7775705
Anchorage	90	7775706
Atlanta	90	7775931
Barrow	90	7774837
Bethel	90	7775884
Billings	90	7775998
Boston	90	7776000
Chicago	90	7776000
Cleveland	90	7774856
Cold Bay	90	7773312
Dallas	90	7775812
Denver	90	7770768
Fairbanks	90	7775959
Gander	90	7775020
Goose Bay	90	7775945
Houston	90	7773831
Iqaluit	88	7589913
Jacksonville	90	7775993
Juneau	90	7775767
Kansas City	90	7775823
Kotzebue	90	7775802
Los Angeles	90	7773230
Memphis	90	7776000
Merida	90	7774255
Mexico City	90	7775869
Miami	90	7774563
Minneapolis	90	7775924
New York	90	7774157
Oakland	90	7775951
Puerto Vallarta	90	7772656
Salt Lake City	90	7775580
San Jose Del Cabo	90	7773676
Seattle	90	7774954
Washington DC	90	7775570
Winnipeg	90	7776000

**San Juan offline for roof reconstruction

Table 1-3 NPA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
Albuquerque	90	7775723
Anchorage	90	7775718
Atlanta	90	7775973
Barrow	90	7775149
Bethel	90	7775842
Billings	90	7775989
Boston	90	7775990
Cleveland	90	7775970
Cold Bay	90	7770323
Fairbanks	90	7775942
Gander	90	7775060
Honolulu	89	7711345
Houston	90	7774426
Iqaluit	88	7581459
Juneau	90	7775750
Kansas City	90	7775983
Kotzebue	90	7772680
Los Angeles	90	7775907
Merida	90	7774824
Miami	90	7775977
Minneapolis	90	7775871
Oakland	90	7775972
Salt Lake City	90	7775971
San Jose Del Cabo	90	7775967
San Juan	90	7771896
Seattle	90	7774456
Tapachula	90	7771964
Washington DC	90	7775909

The report is divided in the performance categories listed below.

1. WAAS Position Accuracy
2. WAAS Operational Service Availability
3. Coverage
4. Integrity
5. WAAS Range Domain Accuracy
6. GEO Ranging Performance
7. WAAS Airport Availability
8. WAAS CNMP Analysis
9. WAAS Antenna Survey Validation
10. SQM Analysis

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 or SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
10/19/11	03/29/13	San Juan (ZSU1), San Juan (ZSU2), San Juan (ZSU3)	Mexico	A facility upgrade required the San Juan reference (ZSU) station to be taken out of service. Taking this WRS out of WAAS system caused reduced service in the Caribbean, Mexico, and caused Miami LPV200 performance to be borderline. March 29, 2013 - San Juan was finally returned to normal mode.
01/08/13	01/08/13	PRN4	LPV200_Canada	A brief carrier phase anomaly on PRN-4 caused WAAS to issue an SV alert setting the status of PRN-4 to "Not Monitored". This resulted in a brief loss of LPV200 coverage in eastern Canada. See: LPV200_coverage_010813
01/09/13	01/09/13	GEO135,Napa (APC)	LPV_Alaska, LPV200_Alaska	Manual switchover from the Napa uplink site for the CRW GEO (PRN-135) to the Littleton uplink site

START DATE	END DATE	LOCATION or SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
				caused a very short outage in north western Alaska where only the CRW WAAS GEO is visible. The switchover was to support planned maintenance on telecommunications circuits' lines at Napa. TOW 320172-320177. (TOW is time of week in GPS seconds)
01/10/13	01/10/13	PRN5	LPV200_CONUS, LPV200_Alaska, LPV200_Canada LPV200_Mexico	Scheduled maintenance on GPS PRN-5 (NANU 2013003 Delta-V) caused minor LPV-200 outages along the west coast of CONUS and in southern New Mexico, Arizona, southern Florida, and Gulf of Mexico. Slightly longer LPV-200 outages were seen in north western Alaska, northern Canada, and eastern Canada. LPV service was not impacted. See: LPV200_coverage_011013
01/15/13	01/15/13		Local (HNL and Pamalu HW)	Multiple ATT/FTI communications lines went down, knocking out both network rings 1 & 2 that redundantly connect WAAS to the Honolulu WRS (HNL) and Pamalu GUS (AMR GEO uplink) sites for approximately 10 hours from TOW 213053 (11:10:38) to TOW 248901 (21:08:06).
01/16/13	01/17/13	PRN20	LPV_CONUS, LPV_Canada, LPV200_CONUS, LPV200_Canada	Scheduled maintenance on GPS PRN-20 (NANU 2013004 Delta-V) caused a significant LPV outage along the west coast of CONUS and a wider area LPV200 outage extending through California into Nevada, New Mexico, central Oregon, western Washington state, and the west coast of Canada. For LPV-200 see: LPV200_coverage_011613 For LPV see: LPV_coverage_011613
01/17/13	01/17/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Canada, LPV200_CONUS, LPV200_Canada	Solar weather activity resulted in increased GIVE values which resulted in losses in LPV and LPV-200 availability in eastern and northern Canada, and losses in LPV and LPV-200 availability in Maine. For LPV-200 see: LPV200_coverage_011713 For LPV see: LPV_coverage_011713
01/21/13	01/21/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV), PRN4	LPV200_CONUS, LPV200_Mexico	A brief carrier phase anomaly on PRN-4 caused WAAS to issue an SV alert setting the status of PRN-4 to "Not Monitored". This resulted in a brief loss of LPV200 coverage along the west coast of CONUS, New Mexico, and western Mexico. See: LPV200_coverage_012113
01/23/13	01/23/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV), PRN30	LPV200_Alaska	WAAS issued a SV Alert for PRN-30 which resulted in a brief loss of LPV-200 service in north western Alaska. See: LPV200_coverage_012313
01/26/13	01/26/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Solar weather related to geomagnetic activity ($K_p = 4$) disturbed the ionosphere and resulted in elevated GIVE values which caused a short loss of LPV-200 service in northern Canada, northern Alaska, and north western Alaska. Position errors at Barrow, Fairbanks, Iqaluit, and Goose Bay were elevated due to the disturbed ionosphere. See: LPV200_coverage_012613

START DATE	END DATE	LOCATION or SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
02/01/13	02/01/13	Cold Bay (CDB1), Cold Bay (CDB2), Cold Bay (CDB3)	LPV200_Alaska	Brief (less than 10 minute) LPV-200 outage observed at CDB (and south west Alaska). See: LPV200_coverage_020113
02/02/13	02/03/13	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	Communication outages to Iqaluit caused a loss of data from Iqaluit which resulted in slightly degraded LPV and LPV200 service in northeast Canada. See: LPV200_coverage_020213 and LPV_coverage_020213
02/03/13	02/03/13	PRN135	LPV200_Alaska	WAAS alerted CRW (PRN-135) to "Do Not Use" for ranging, which resulted in an enlargement of the daily LPV-200 outage in north western Alaska. CRW was set to DNU from TOW 47720-50510. See: LPV200_coverage_020313
02/05/13	02/05/13	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	Extended communication outages to Iqaluit resulted in loss of data from the Iqaluit reference station which resulted in degraded LPV and LPV200 service in eastern Canada due to IGP values being set to "Not Monitored" See: LPV200_coverage_020513
02/06/13	02/06/13	PRN17	LPV_Canada, LPV200_CONUS, LPV200_Canada	Scheduled maintenance on GPS PRN-20 (NANU 2013016 Delta-V) caused a significant LPV-200 outage in eastern Canada and New England. The event also caused a widespread but brief LPV outage in eastern Canada. For LPV-200 see: LPV200_coverage_020613 For LPV see: LPV_coverage_020613
02/10/13	02/10/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV), PRN21	LPV200_CONUS	A brief carrier phase anomaly on PRN-21 caused WAAS to issue an SV alert setting the status of PRN-21 to "Not Monitored". This resulted in a brief enlargement of the impact area of the daily loss of LPV-200 service in southern New Mexico such that the impact area expanded north to Four Corners. See: LPV200_coverage_021013
02/13/13	02/13/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV), PRN1	None	The WAAS ZDC master station Corrections and Verification subsystem (CnV) alarmed PRN-1 to “Not Monitored”. However, the other two WAAS master stations set PRN-1 to “Not Monitored”, but did not alarm (i.e. repeat the message 4 times). This event was reviewed by Raytheon and it was determined that the normal differences in the recent history of the WAAS user messages sequences between the CnVs resulted in a timing condition where only ZDC required an alarm.
02/13/13	02/13/13	PRN10	LPV200_CONUS, LPV200_Mexico	Scheduled maintenance on GPS PRN-10 (NANU 2013018 Delta-V) caused a LPV-200 outage in western Mexico and most of Florida. See: LPV200_coverage_021313
02/14/13	02/14/13	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	Local	An RFI event caused a brief loss of tracking on all three receivers at ZDC resulting in brief local LPV and LPV-200 outages

START DATE	END DATE	LOCATION or SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
02/18/13	02/18/13	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	Local	An RFI event caused a brief partial loss of tracking on all three receivers at ZDC resulting in a brief local LPV-200 outage. LPV service was maintained.
02/20/13	02/20/13	GEO135, Littleton (APA)	LPV_Alaska, LPV200_Alaska	Manual switchover from the Littleton uplink site for the CRW GEO (PRN-135) to the Napa uplink site caused a very short outage in NW Alaska where only the CRW WAAS GEO is visible. TOW 288027-288032
02/24/13	03/08/13	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	Data outages to the Iqaluit reference station caused loss of service in the northeast area of Canada. See: LPV200_coverage_022413
02/27/13	02/27/13	Los Angeles (ZLA1), Los Angeles (ZLA2), Los Angeles (ZLA3)	None	LA WRS was unavailable for WAAS processing due RFI on the L2 frequency. Event lasted about 3000 seconds.
03/01/13	03/02/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada LPV200_CONUS	Geomagnetic activity caused by solar weather resulted in elevated GIVE values for northern IGPs on 3/1/13 with continuation into the beginning of 3/2/13. The planetary geomagnetic index (K_p) was 5 on 3/1/13 and 4 on 3/2/13. The elevated GIVEs caused LPV-200 outages in north eastern Canada and slightly expanded the daily LPV-200 outage in western Oregon. see: LPV200_coverage_030113 and LPV_coverage_030113
03/06/13	03/07/13	PRN13	LPV200_CONUS	Scheduled maintenance on GPS PRN-13 (NANU 2013020 Delta-V) caused a brief LPV-200 outage in the center of CONUS. see: LPV200_coverage_030613 and LPV200_coverage_030713
03/12/13	03/15/13	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Continued communication outages and maintenance at Iqaluit is causing increased GIVEs and loss of service. Ring 1 has been down since early January and more than expected outages on ring 2 has degraded service. 3/15/13 - Changing the up-link frequency resolved the communication outage on ring 1.
03/17/13	03/17/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_All	Geomagnetic activity (K_p = 6) related to a solar flare (Coronal Mass Ejection - CME) resulted in elevated GIVEs and loss of LPV service in Canada and Alaska and LPV200 service in Canada, Alaska, Mexico, and southern Florida. For LPV-200 see: LPV200_coverage_031713 For LPV see: LPV_coverage_031713
03/19/13	03/19/13	GEO138, Brewster (BRE-B)	LPV200_CONUS, LPV200_Mexico	The uplink to the CRE GEO (PRN-138) switched from Brewster WA to Woodbine MD due to a GUS receiver SCAF fault at Brewster. LPV-200 service was affected. TOW 192013-192025

START DATE	END DATE	LOCATION or SATELLITE	SERVICE AFFECTED	EVENT DESCRIPTION
				See: LPV200_coverage_031913
03/20/13	03/20/13	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	Local	RFI caused loss short (~ 90 sec) degradation in tracking for all 3 receivers at the ZDC reference station. This resulted in a local LPV-200 service outage at ZDC.
03/25/13	03/25/13	GEO138,Woodbine (QWE)	LPV200_Canada	Manual uplink switch for the CRE GEO (PRN-138) resulted in a minor expansion to the west for the daily LPV-200 outage in northwestern Canada. TOW 118896-118901 See: LPV200_coverage_032513
03/27/13	03/27/13	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV), PRN133, PRN135, PRN138	LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	A manual CnV source select for the GEO in preparation for maintenance caused increased UDREs on all three GEOs. This combined with elevated GIVE values resulting from geomagnetic disturbances to the ionosphere ($K_p = 4$) from solar weather resulted in degraded LPV-200 service across the northern part of the WAAS coverage area and a small coastal area of southern California. There was also a minor LPV outage in north central Canada. For LPV-200 see: LPV200_coverage_032713 For LPV see: LPV_coverage_032713
03/28/13	03/28/13	PRN30	LPV200_Canada	Unplanned maintenance on PRN-30 (NANU 2013022) caused minor loss of LPV-200 coverage along the northeast coast of Canada. See: LPV200_coverage_032813
03/29/13	03/29/13	Washington D.C. (CnV), PRN135	LPV_Alaska, LPV200_Alaska	ZDC CnV was the selected source for the CRW GEO (PRN-135) and alerted PRN 135 to "Do Not Use". This resulted in the temporary loss of use of ranging from the CRW GEO. TOW 464564-466513 (UDREi 10 bumped to 15). This event occurred at the same time GEO ranging from CRW was critical to LPV and LPV-200 service in northwestern Alaska. LP service was not impacted. For LPV-200 see: LPV200_coverage_032913 For LPV see: LPV_coverage_032913
03/29/13	03/29/13	Barrow (BRW1), Barrow (BRW2), Barrow (BRW3), Fairbanks (FAI1), Fairbanks (FAI2), Fairbanks (FAI3), Gander (YQX1), Gander (YQX2), Gander (YQX3), Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3), Kotzebue	Local	Geomagnetic disturbances to the ionosphere resulting from solar weather ($K_p = 5$) caused scintillation which resulted in elevated vertical errors at several Alaska and Canadian sites. The scintillation also caused partial loss of tracking which resulted in LPV and LPV-200 service outages for the Iqaluit receivers and LPV200 service outages for the Gander receivers. See DR# 113 Ionospheric Scintillation Causes Elevated Vertical Errors at Higher Latittude WAAS Reference Stations.

Table 1-6 WAAS Upgrades

There are no WAAS upgrades for this quarter.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location/ Satellite	Service Affected	Event Description
01/02/13	01/02/13	Faulted	GEO133, Santa Paula (SZP)	None	The uplink site to the AMR GEO (PRN-133) switched from Santa Paula to Pamalu when Santa Paula faulted. Service was not affected. TOW 293432-293452. On this day, following 8 missed WAAS user messages, Santa Paula uplink site transitioned to Backup mode at 09:20:38, then faulted one second later. Pamalu uplink site successfully transitioned to Primary mode, with initial loop lock achieved in 68 seconds. Root cause of the switchover and subsequent Santa Paula fault was a loss of commercial power at the Santa Paula site.
01/06/13	01/06/13	Faulted	GEO133, Pamalu (HDH)	None	The uplink site to the AMR GEO (PRN-133) switched to Santa Paula when Pamalu faulted. Service was not affected. TOW 4997-5010
01/09/13	01/09/13	Manual	GEO135,Napa (APC)	LPV_Alaska, LPV200_Alaska	Manual switchover from the Napa uplink site for the CRW GEO (PRN-135) to the Littleton uplink site caused a very short outage in northwestern Alaska where only the CRW WAAS GEO is visible. The switchover was to support planned maintenance on telecommunications circuits' lines at Napa. TOW 320172-320177.
02/20/13	02/20/13	Manual	GEO135,Littleton (APA)	LPV_Alaska, LPV200_Alaska	Manual switchover from the Littleton uplink site for the CRW GEO (PRN-135) to the Napa uplink site caused a very short outage in NW Alaska where only the CRW WAAS GEO is visible. TOW 288027-288032
02/28/13	02/28/13	Faulted	GEO138, Brewster (BRE-B)	None	CRE GEO (PRN-138) switched to Woodbine uplink site when Brewster uplink site faulted. L5 GEO Downlink message faulted with messages not received on L5. Service was not affected. TOW 350001-350014

Start Date	End Date	GUS Switch	Location/ Satellite	Service Affected	Event Description
03/05/13	03/05/13	Manual	GEO138,Woodbine (QWE)	None	Manual switchover from the Woodbine uplink site for the CRE GEO (PRN-138) to the Brewster had no impact on service. TOW 245724-245729
03/11/13	03/11/13	Manual	GEO133, Santa Paula (SZP)	None	AMR GEO (PRN-133) had a manual switchover from Santa Paula uplink site to Pamalu uplink site due to engine generator maintenance. Service was not affected. TOW 142191-142196
03/19/13	03/19/13	Faulted	GEO138, Brewster (BRE-B)	LPV200_CONUS, LPV200_Mexico	The uplink to the CRE GEO (PRN-138) switched from Brewster to Woodbine due to a GUS receiver SCAF fault at Brewster. LPV-200 service was affected. TOW 192013-192025 See: LPV200_coverage_031913
03/25/13	03/25/13	Manual	GEO138,Woodbine (QWE)	LPV200_Canada	Manual uplink switch for the CRE GEO (PRN-138) resulted in a minor expansion to the west for the daily LPV-200 outage in northwestern Canada. TOW 118896-118901 See: LPV200_coverage_032513

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.

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 1.366 meters at Atlantic City and 1.767 meters at Miami, respectively. The minimum 95% CONUS horizontal and vertical LPV errors are 0.61 meters at Oakland and 0.777 meters at Denver, respectively. The maximum 95% and 99.999% NPA horizontal errors are 5.7 meters at Honolulu and 13.074 meters at San Juan, respectively. The minimum 95% and 99.999% horizontal errors are 1.142 meters at Oakland and 3.219 meters at Minneapolis, respectively.

The increases in 95% position errors on 3/17/2013 in Figures 2-1 to 2-8 are due to geomagnetic activity. The increases in 95% position errors in Alaska and Canada on 1/17/2013 and 1/26/13 in Figure 2-1 to 2-8 are also due to geomagnetic activity. The increase in 95% NPA position errors in CONUS on 3/1/13 in Figure 2.7 to 2.8 are due to geomagnetic activity as well.

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	1.300	1.300	1.479	100	*	*
Atlantic City	1.366	1.366	1.377	100	*	*
Grand Forks	1.223	1.223	1.423	100	*	*
Oklahoma City	0.994	0.994	1.274	100	*	*
Albuquerque	0.658	0.658	0.959	100	1.977	4.512
Anchorage	0.634	0.634	1.259	100	*	*
Atlanta	0.735	0.735	1.268	100	2.368	4.367
Barrow	0.666	0.666	1.358	100	*	*
Bethel	0.550	0.550	0.930	100	2.024	5.417
Billings	0.825	0.825	0.915	100	2.037	4.174
Boston	0.855	0.855	1.037	100	2.670	3.998
Chicago	0.871	0.871	0.825	100	*	*
Cleveland	0.700	0.700	0.931	100	2.500	4.001
Cold Bay	0.650	0.650	1.062	100	*	*
Dallas	0.692	0.692	1.251	100	*	*
Denver	0.621	0.621	0.777	100	*	*
Fairbanks	0.546	0.546	1.052	100	2.009	5.349
Gander	0.793	0.795	1.166	100	*	*
Goose Bay	0.810	0.812	1.160	100	*	*
Houston	0.733	0.733	1.614	100	6.848	5.951
Iqaluit	0.984	0.989	1.669	100	*	*
Jacksonville	0.775	0.775	1.468	100	*	*
Juneau	0.635	0.635	1.086	100	*	*
Kansas City	0.657	0.657	0.866	100	2.225	4.154
Kotzebue	0.604	0.604	1.146	100	2.120	5.586
Los Angeles	0.656	0.656	1.040	100	1.915	5.041
Memphis	0.771	0.771	1.082	100	*	*
Merida	0.740	0.740	1.660	100	*	*
Mexico City	0.771	0.771	1.928	100	*	*
Miami	0.923	0.923	1.767	100	2.737	4.903
Minneapolis	0.758	0.758	0.834	100	2.254	4.009
New York	0.826	0.826	1.068	100	*	*
Oakland	0.610	0.610	0.964	100	1.894	5.038
Puerto Vallarta	0.801	0.802	1.899	100	*	*
Salt Lake City	0.658	0.658	0.797	100	1.935	4.461
San Jose Del Cabo	0.793	0.793	1.929	100	*	*
Seattle	0.736	0.736	0.868	100	1.895	4.475
Washington DC	0.819	0.819	1.118	100	2.591	4.226
Winnipeg	0.698	0.698	1.088	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	1.196	6.446	100	6.657
Anchorage	1.715	4.028	100	4.200
Atlanta	1.487	5.432	100	5.590
Barrow	1.717	3.624	100	3.737
Bethel	1.524	3.516	100	3.757
Billings	1.582	3.330	100	3.487
Boston	1.906	3.750	100	3.905
Cleveland	1.474	3.866	100	4.013
Cold Bay	1.438	4.194	100	4.585
Fairbanks	1.572	3.278	100	3.412
Gander	1.831	3.828	100	3.990
Honolulu	5.700	11.785	100	12.107
Houston	1.696	7.295	100	7.515
Iqaluit	2.107	6.059	100	6.147
Juneau	1.508	3.263	100	3.990
Kansas City	1.271	5.415	100	5.569
Kotzebue	1.590	3.945	100	4.070
Los Angeles	1.461	6.320	100	6.532
Merida	2.243	5.676	100	5.811
Miami	1.911	5.247	100	5.433
Minneapolis	1.539	3.219	100	3.437
Oakland	1.142	4.653	100	4.852
Salt Lake City	1.274	3.593	100	3.841
San Jose Del Cabo	2.214	6.483	100	6.651
San Juan	2.766	13.074	100	13.357
Seattle	1.321	3.321	100	3.542
Tapachula	3.176	9.914	100	10.187
Washington DC	1.791	4.429	100	4.619

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	3.475	0.246	0.248	4.657	0.096	0.179
Atlantic City	2.46	0.228	0.245	3.804	0.214	0.223
Grand Forks	2.646	0.21	0.253	3.922	0.181	0.207
Oklahoma City	2.131	0.223	0.238	3.558	0.159	0.213
Albuquerque	1.935	0.185	0.218	3.018	0.116	0.168
Anchorage	1.581	0.122	0.143	5.25	0.258	0.258
Atlanta	1.694	0.182	0.182	2.83	0.173	0.173
Barrow	2.218	0.154	0.159	6.333	0.257	0.257
Bethel	3.538	0.238	0.238	5.161	0.218	0.218
Billings	1.765	0.178	0.178	2.828	0.125	0.146
Boston	1.869	0.168	0.169	4.522	0.205	0.205
Chicago	1.821	0.189	0.189	2.503	0.152	0.152
Cleveland	1.654	0.164	0.172	2.803	0.172	0.175
Cold Bay	2.122	0.063	0.101	2.924	0.097	0.1
Dallas	2.432	0.269	0.269	3.12	0.177	0.222
Denver	1.534	0.16	0.168	3.229	0.113	0.16
Fairbanks	2.265	0.136	0.196	5.096	0.176	0.258
Gander	2.413	0.117	0.117	4.416	0.098	0.112
Goose Bay	3.678	0.1	0.149	4.499	0.1	0.153
Houston	3.081	0.293	0.299	3.865	0.213	0.238
Iqaluit	3.269	0.101	0.181	5.914	0.141	0.17
Jacksonville	1.611	0.168	0.168	2.854	0.16	0.176
Juneau	1.734	0.136	0.153	3.762	0.153	0.181
Kansas City	1.805	0.203	0.204	2.932	0.127	0.155
Kotzebue	2.549	0.116	0.15	5.983	0.141	0.222
Los Angeles	2.062	0.169	0.173	2.872	0.145	0.145
Memphis	1.876	0.191	0.212	2.341	0.137	0.174
Merida	2.144	0.107	0.152	5.715	0.149	0.174
Mexico City	1.952	0.145	0.145	3.986	0.142	0.166
Miami	2.298	0.133	0.152	3.568	0.167	0.178
Minneapolis	1.675	0.155	0.172	2.566	0.158	0.159
New York	1.834	0.179	0.179	3.366	0.187	0.187
Oakland	1.819	0.16	0.16	2.88	0.092	0.154
Puerto Vallarta	2.047	0.055	0.106	4.119	0.084	0.19
Salt Lake City	1.803	0.098	0.178	2.835	0.11	0.16
San Jose Del Cabo	2.003	0.14	0.148	4.661	0.167	0.174
Seattle	1.947	0.17	0.17	3.009	0.107	0.167
Washington DC	1.814	0.159	0.164	2.883	0.174	0.174
Winnipeg	2.528	0.234	0.234	5.629	0.214	0.22

Figure 2-1 LPV 95% Horizontal Accuracy

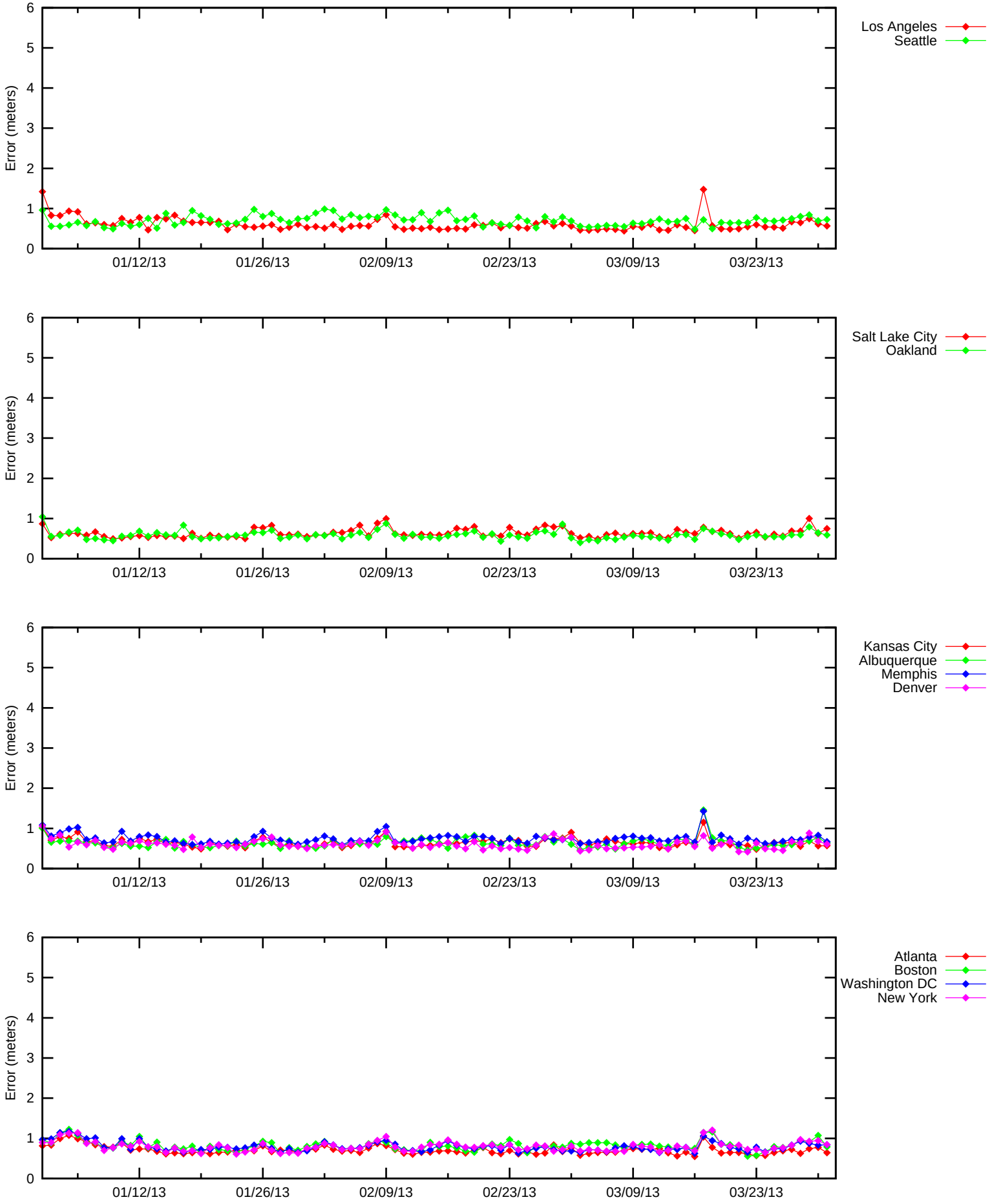


Figure 2-2 LPV 95% Horizontal Accuracy

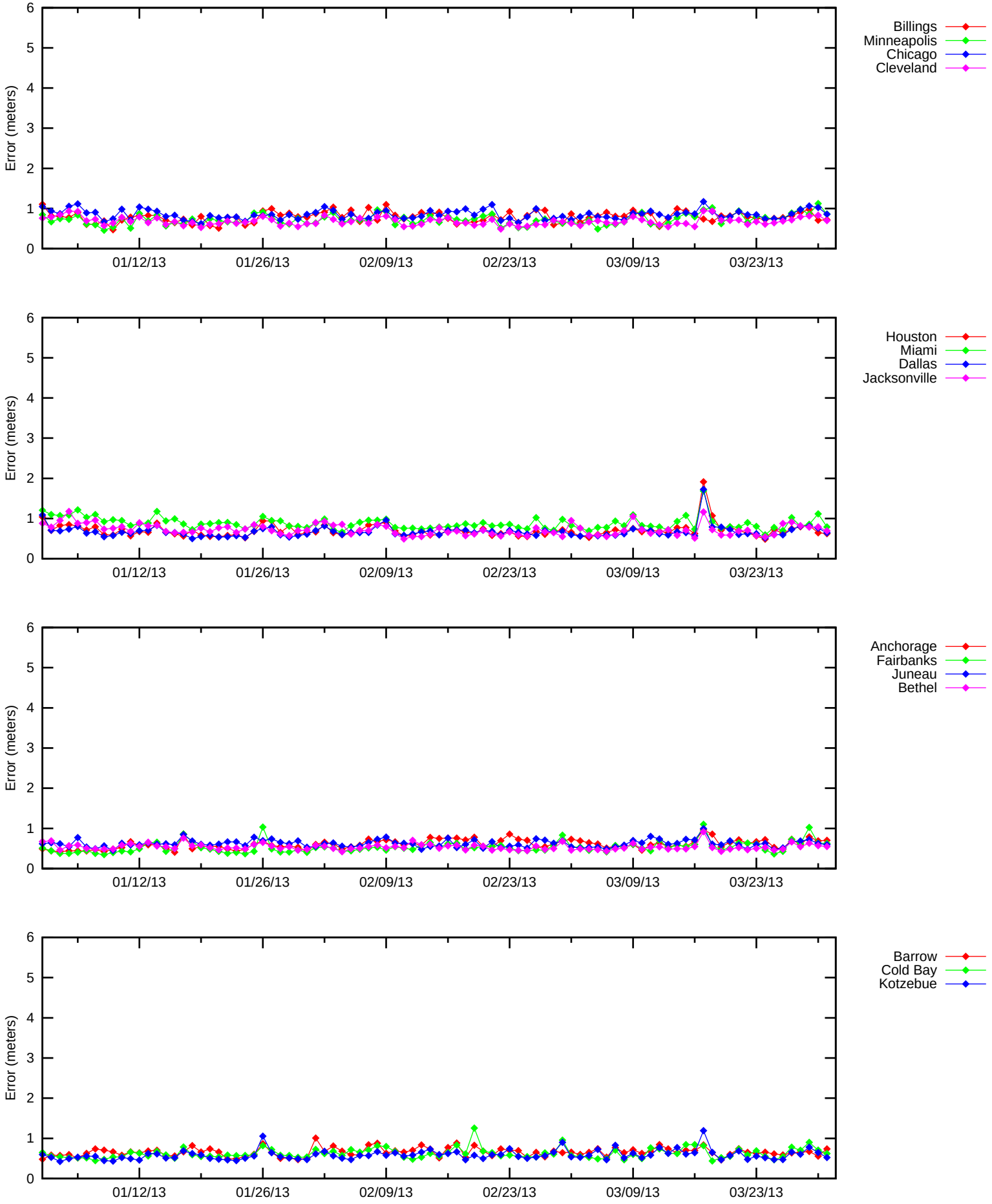


Figure 2-3 LPV 95% Horizontal Accuracy

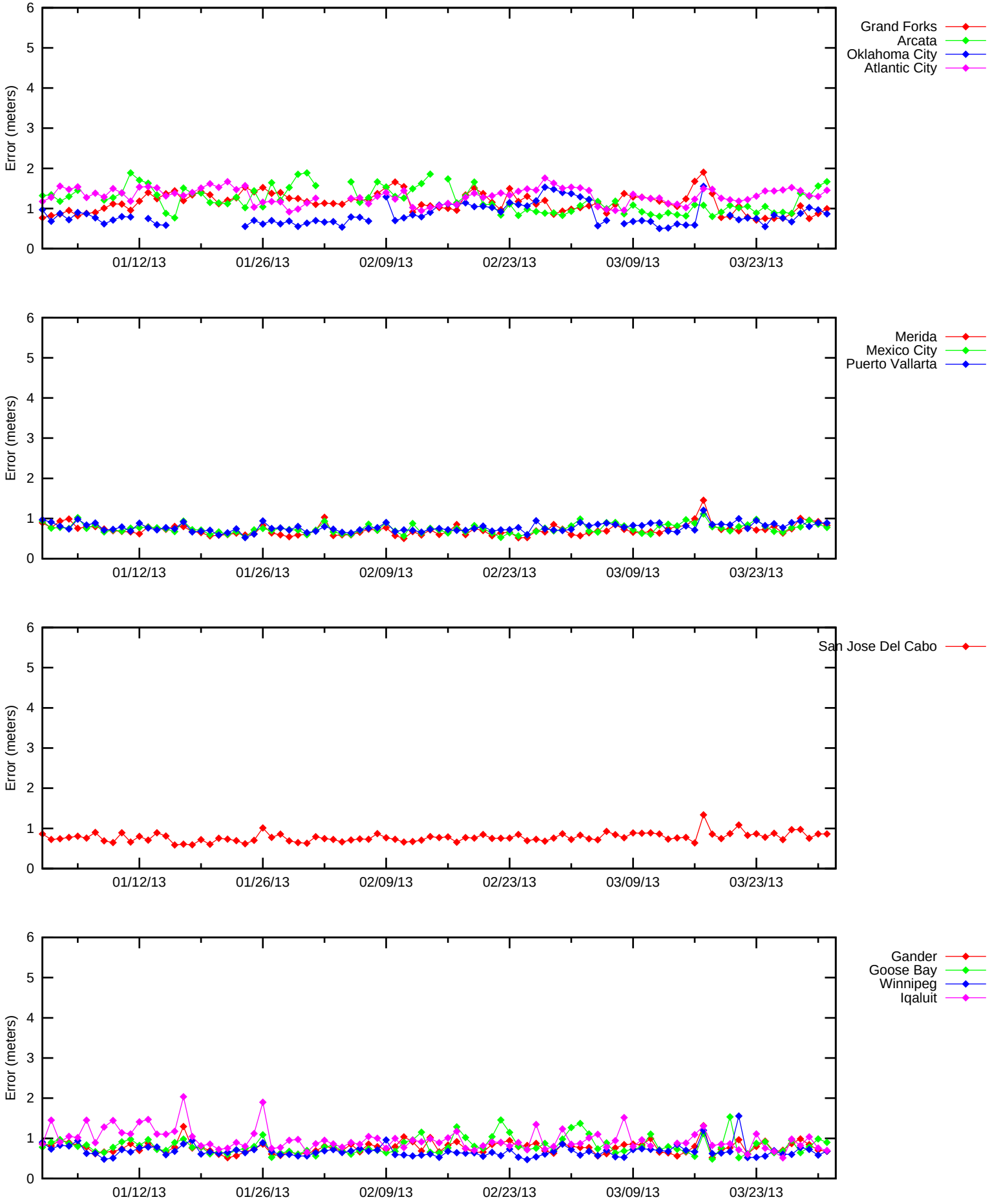


Figure 2-4 LPV 95% Vertical Accuracy

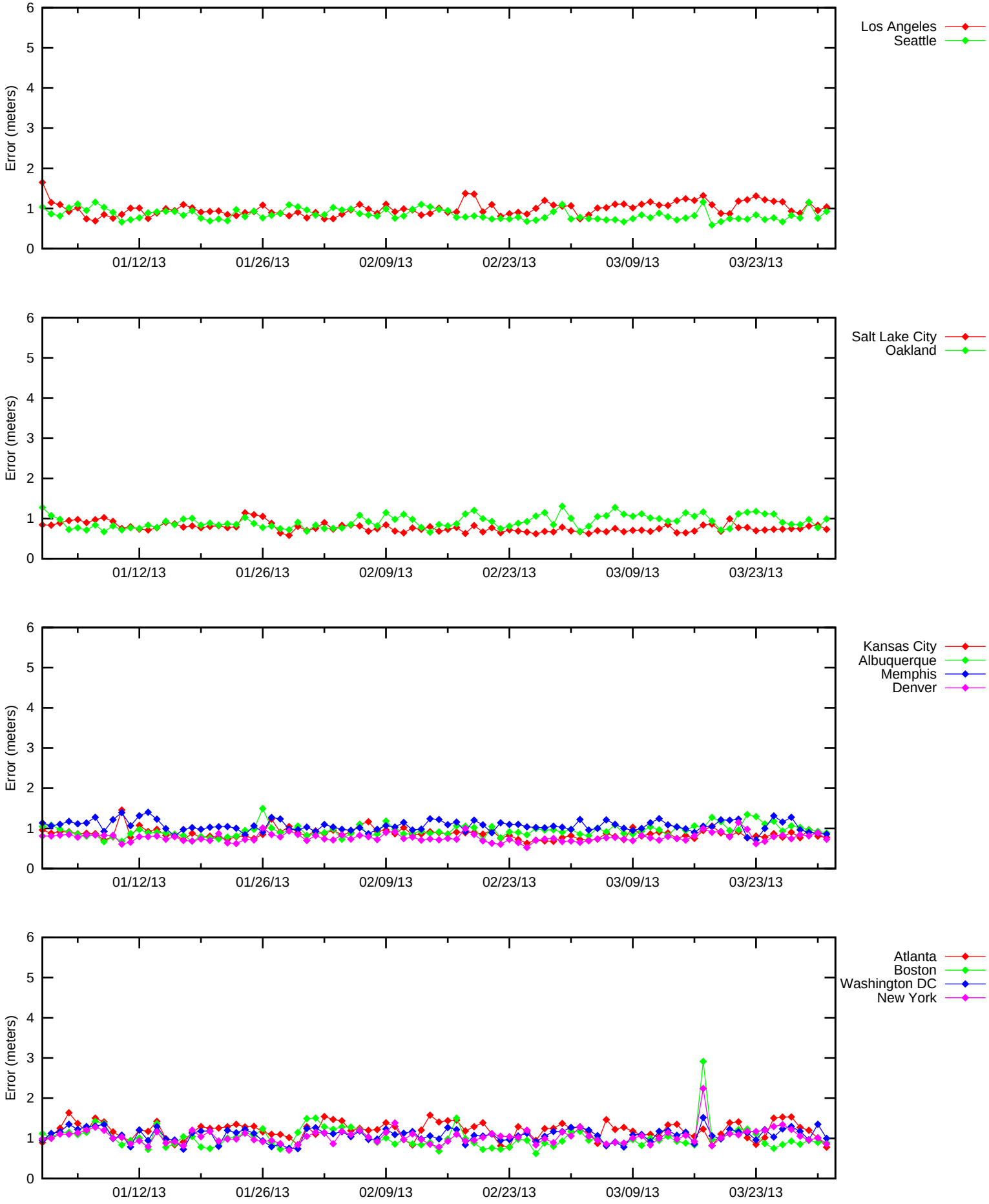


Figure 2-5 LPV 95% Vertical Accuracy

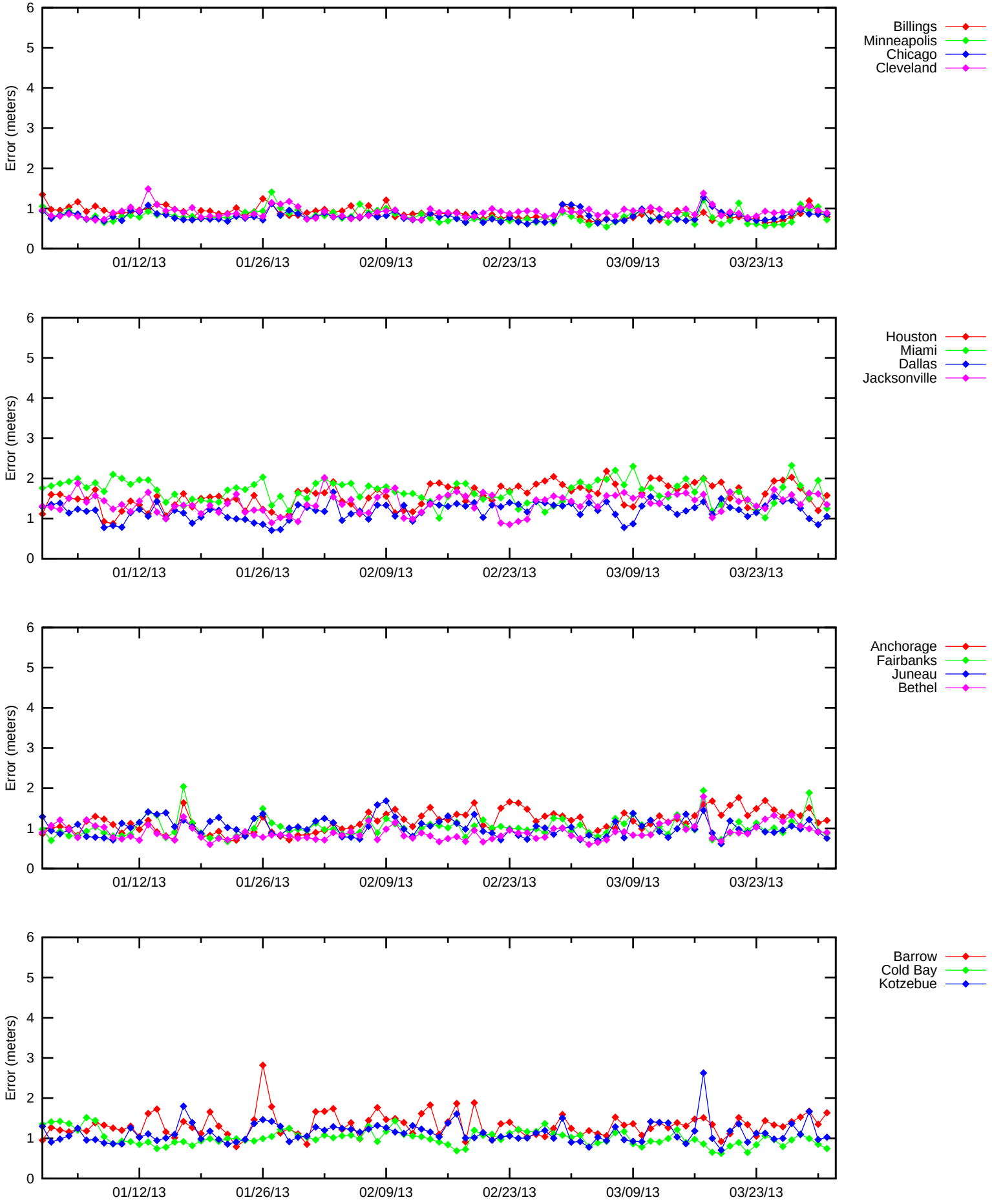


Figure 2-6 LPV 95% Vertical Accuracy

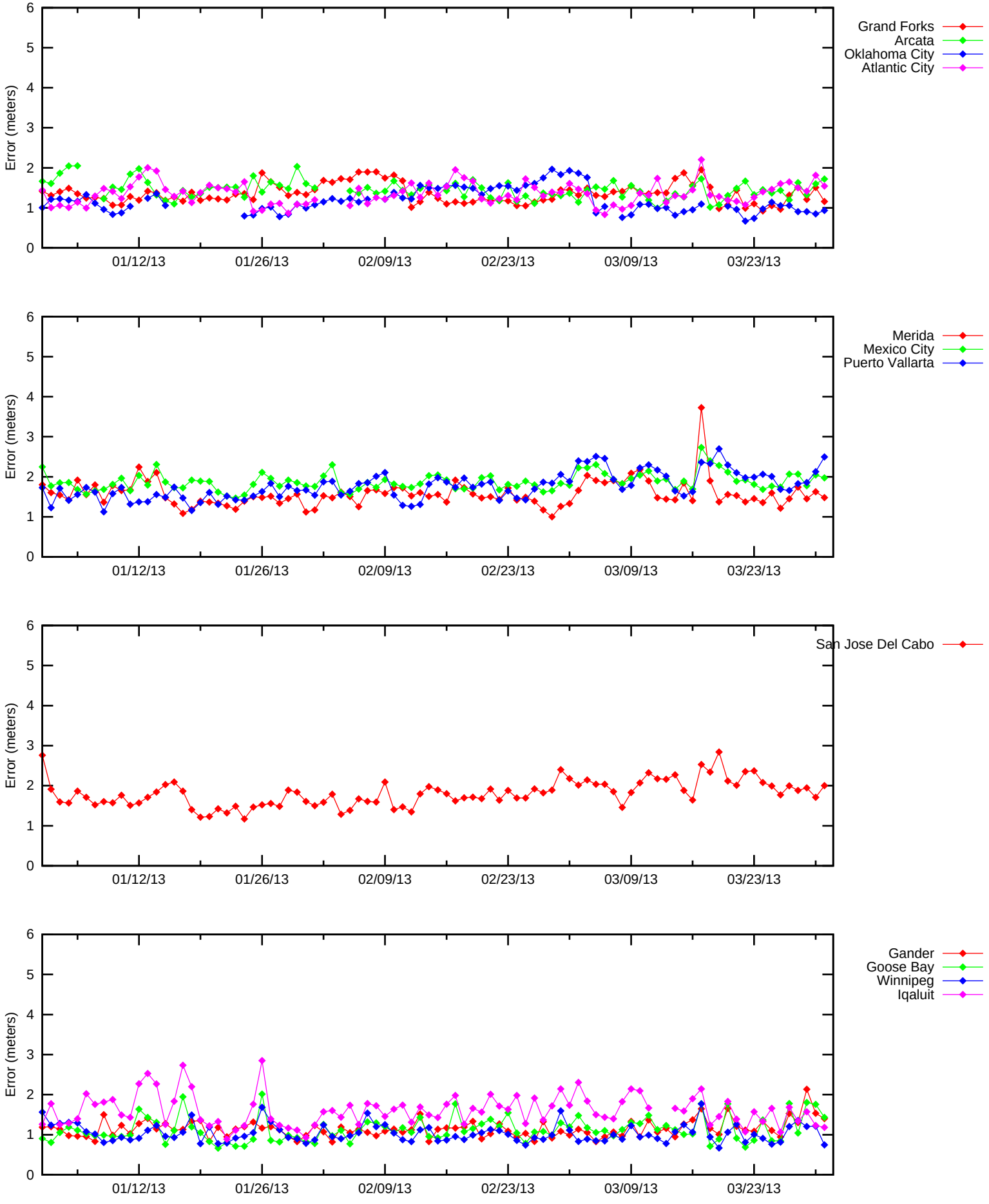


Figure 2-7 NPA 95% Horizontal Accuracy

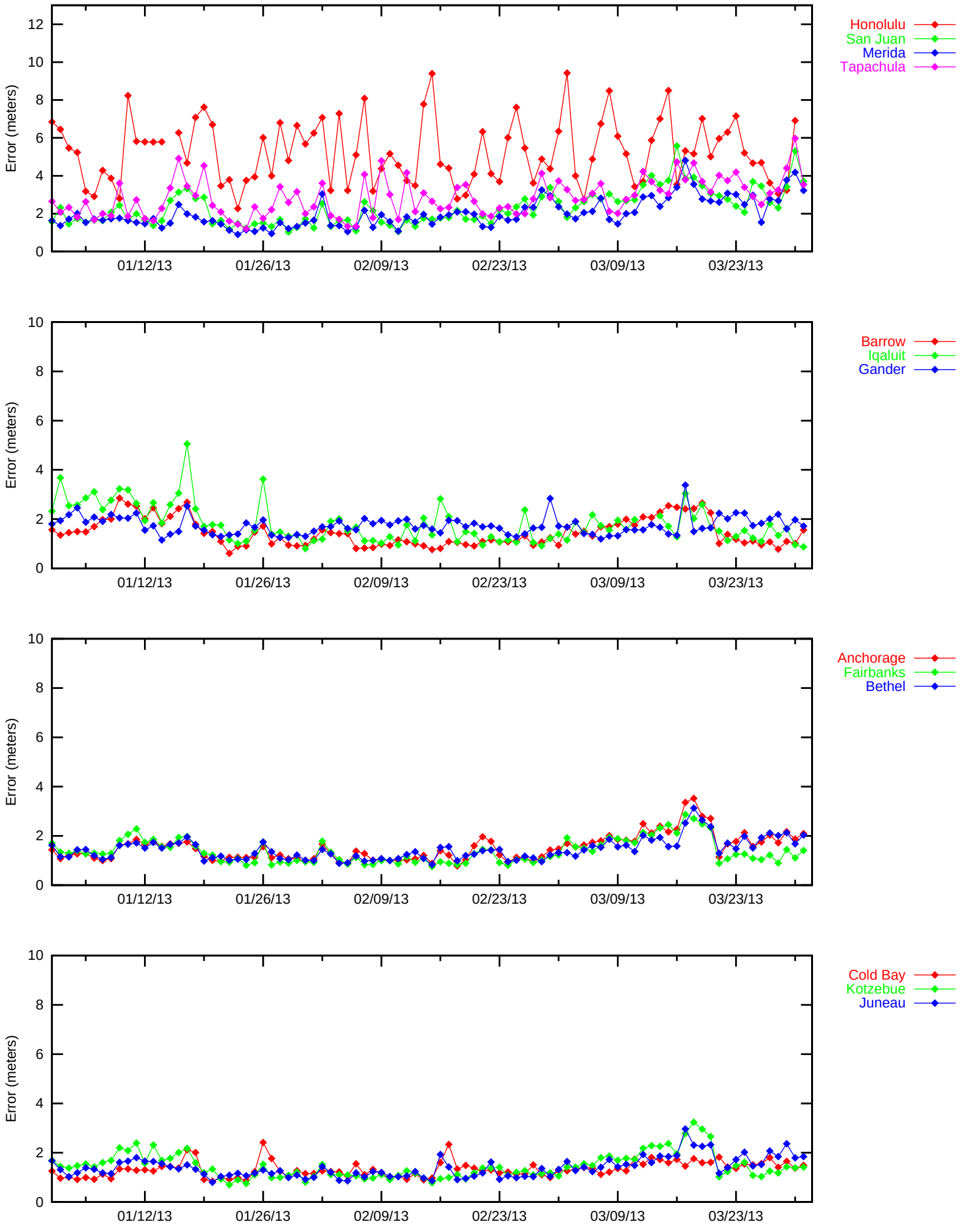


Figure 2-8 NPA 95% Horizontal Accuracy

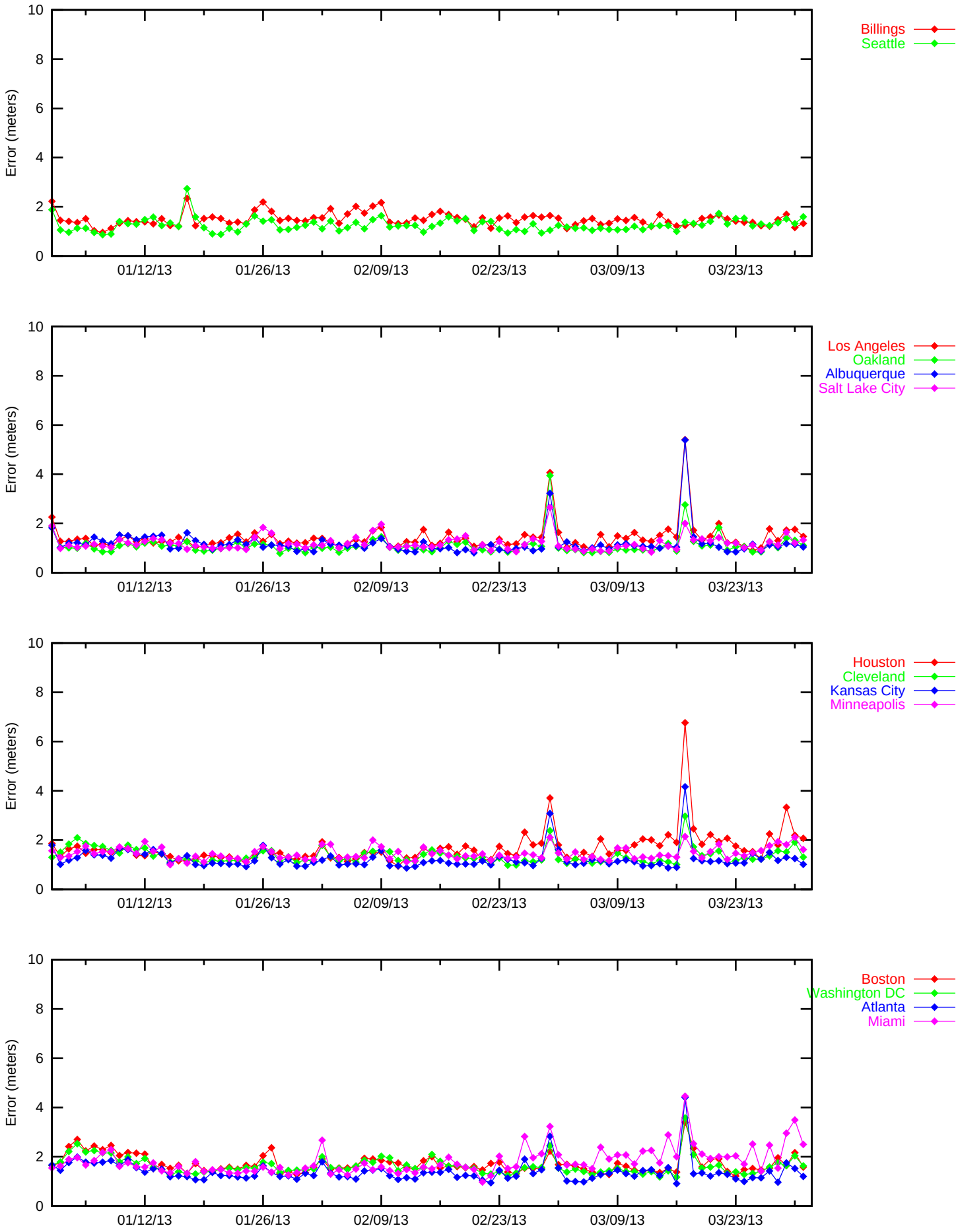


Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

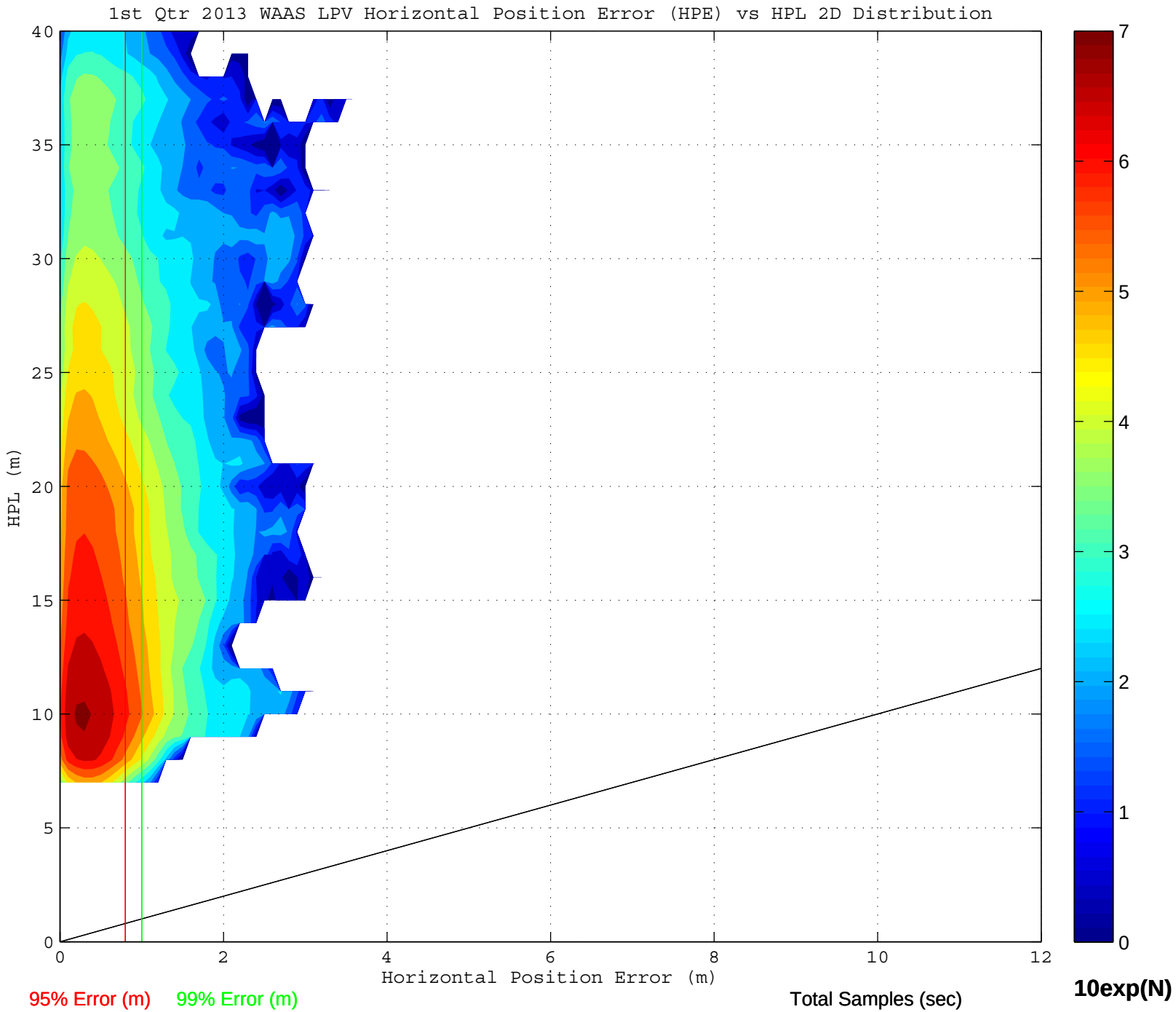


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

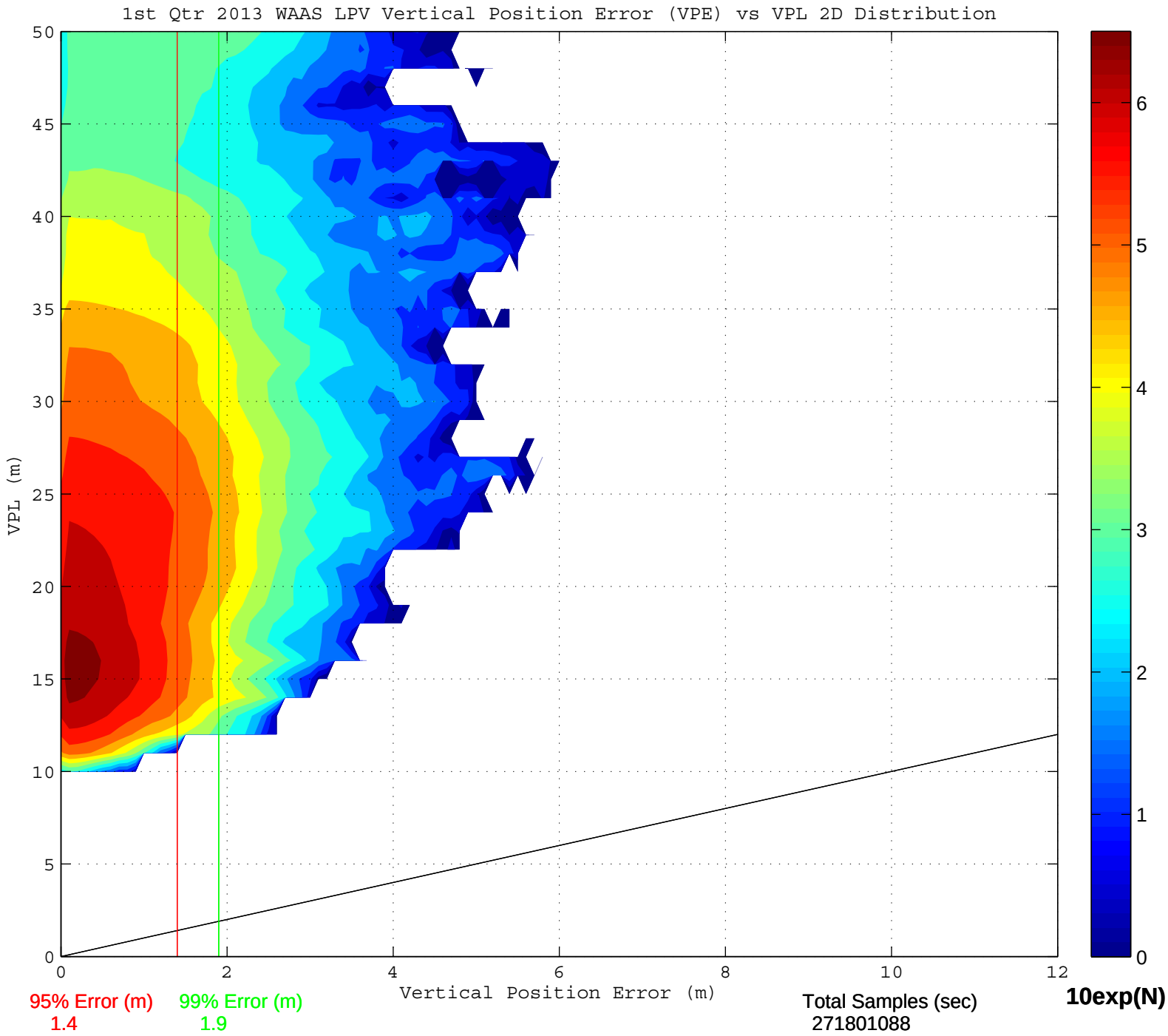


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

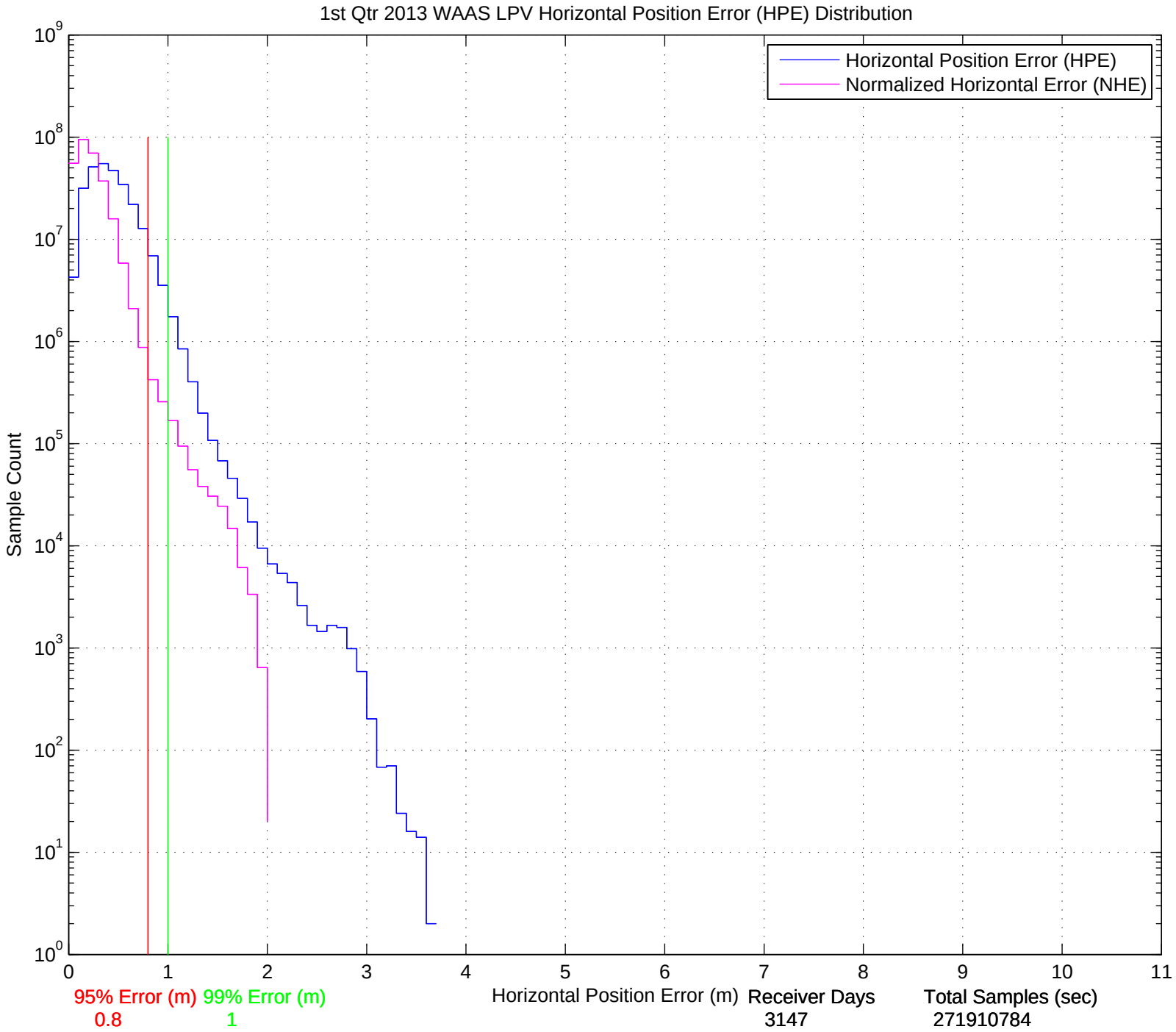
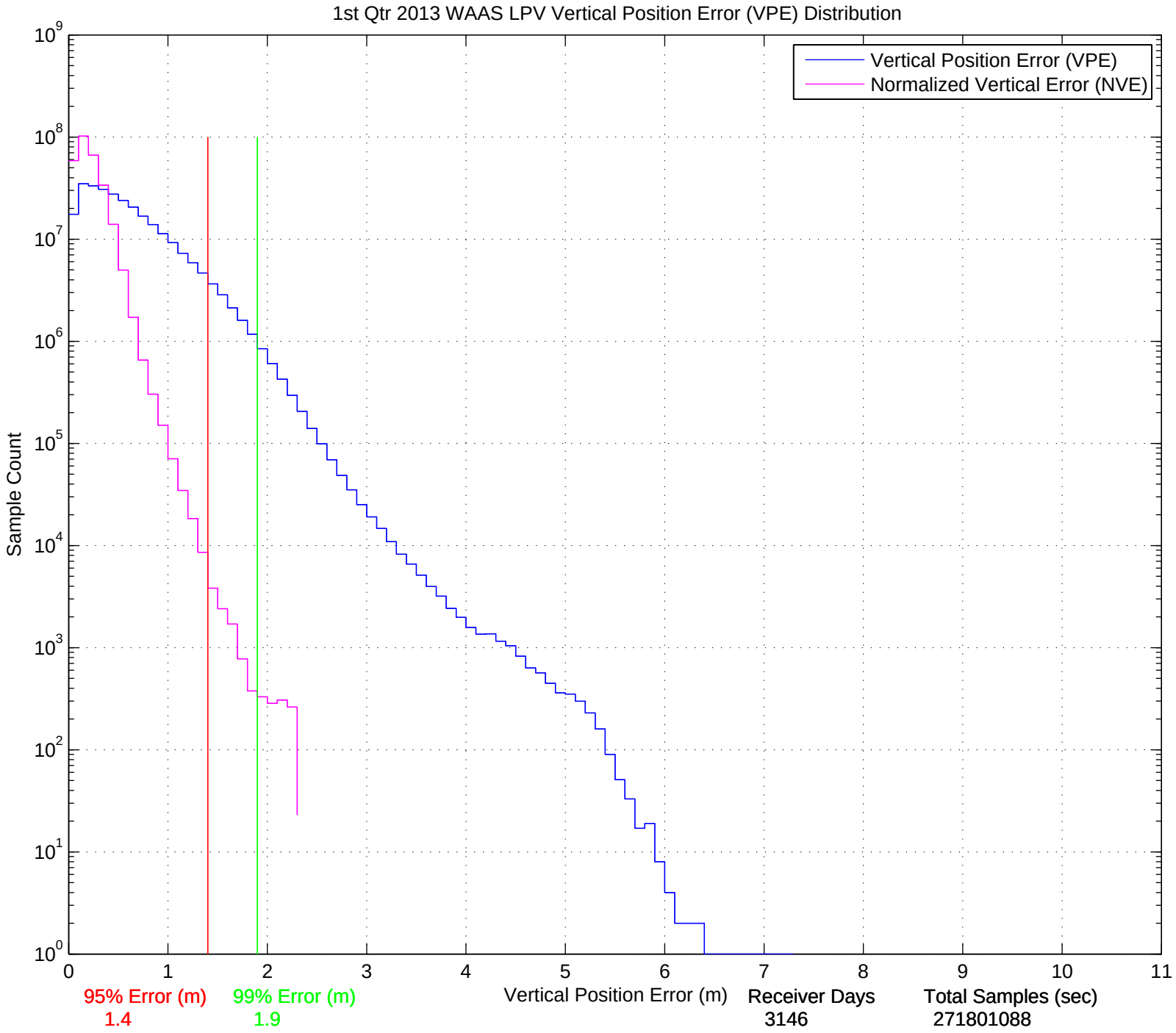


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



3.0 AVAILABILITY

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

For this reporting period, the maximum 99% CONUS HPL and VPL are 19.663 meters at Miami and 35.743 meters, at Arcata, respectively. The minimum 99% CONUS HPL and VPL are 10.766 meters at Memphis and 17.976 meters at Chicago, respectively. The maximum 99% Alaska HPL and VPL are 28.434 meters and 37.722 meters, both at Cold Bay, respectively. The minimum 99% Alaska HPL and VPL are 13.577 meters at Fairbanks and 22.413 meters at Juneau, respectively.

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

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

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

Minor degradation in availability in Alaska and Canada was observed after March 27th due to PRN-30 removal from service until further notice.

Manual GUS switchover on CRW GEO (PRN-135) on January 9th and February 20th elevated UDRE values and reduced Alaska availability. Manual CnV source select change on all three GEOs on March 27th in preparation for maintenance increased UDRE values on all three GEOs and reduced CONUS, Alaska and Canada availability.

A brief carrier phase anomaly on PRN-4 on January 21st caused WAAS to issue an SV alert setting PRN 4 to "Not Monitored" slightly affected LPV-200 CONUS and Mexico availability. A another brief carrier phase anomaly on PRN-21 on February 10th caused WAAS to issue an SV alert setting PRN-21 to "Not Monitored" resulted in a minor reduction in LPV-200 CONUS availability.

Geomagnetic activity on January 17th, January 26th, March 17th and March 29th elevated GIVE values and reduced Alaska and Canada availability. Geomagnetic activity on January 17th also reduced CONUS availability. Geomagnetic activity on January 13th, March 1st and 2nd reduced Canada availability. Scintillation as a result of geomagnetic activity on March 1st caused localized loss of LPV/LPV-200 availability at Barrow reference stations due to the loss of satellite tracking that increased the VPL. Geomagnetic activity on March 29th caused scintillation elevating vertical errors at Alaska and Canada sites with slight effect on availability; see DR# 113 Ionospheric Scintillation Causes Elevated Vertical Errors at Higher Latittude WAAS Reference Stations.

Planned maintenance on PRN-5 on January 10th affected CONUS, Alaska and Canada availability. Planned maintenance on PRN-20 on January 16th and 17th reduced CONUS, Alaska and Canada availability. Planned maintenance on PRN-17 on February 6th affected CONUS, Alaska and Canada availability. Planned Maintenance on PRN-10 on February 13th slightly decreased CONUS availability.

Extended communication outages and maintenance at Iqaluit increased GIVE values at northern latitudes due to the loss of data from Iqaluit reference stations and resulted in minor availability reduction in Canada and Alaska.

Radio frequency interference (RFI) caused localized loss of LPV/LPV200 availability at Washington, D.C. on February 14th, February 18th, March 20th, and Los Angeles on February 27th, 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	15.241	35.743	100
Atlantic City	13.873	20.835	100
Grand Forks	13.290	23.606	100
Oklahoma City	12.308	22.643	100
Albuquerque	12.590	25.792	100
Anchorage	14.221	23.348	100
Atlanta	12.021	19.048	100
Barrow	17.424	34.303	100
Bethel	18.555	30.178	100
Billings	11.524	22.238	100
Boston	14.808	21.446	100
Chicago	11.926	17.976	100
Cleveland	11.626	18.408	100
Cold Bay	28.434	37.722	100
Dallas	11.445	21.395	100
Denver	11.014	24.990	100
Fairbanks	13.577	24.059	100
Gander	23.367	38.209	100
Goose Bay	18.367	28.965	100
Houston	11.718	22.664	100
Iqaluit	28.362	42.896	100
Jacksonville	14.060	21.456	100
Juneau	13.827	22.413	100
Kansas City	11.521	18.730	100
Kotzebue	16.321	32.098	100
Los Angeles	15.018	28.584	100
Memphis	10.766	18.188	100
Merida	19.639	32.151	100
Mexico City	27.709	37.192	100
Miami	18.663	28.173	100
Minneapolis	11.791	21.372	100
New York	14.308	21.031	100
Oakland	14.655	32.305	100
Puerto Vallarta	34.721	47.860	100
Salt Lake City	11.316	21.925	100
San Jose Del Cabo	29.474	45.739	100
Seattle	13.313	23.186	100
Washington DC	12.831	19.337	100
Winnipeg	13.420	22.830	100

Table 3-2 Quarterly Availability Statistics

Location	LP WAAS With 15 minute window	LPV WAAS *With 15 minute window*	LPV 200 WAAS *With 15 minute window*
Arcata	1	0.997863	0.983514
Atlantic City	1	1	0.999617
Grand Forks	1	1	1
Oklahoma City	1	1	1
Albuquerque	1	1	0.999993
Anchorage	1	1	1
Atlanta	1	1	1
Barrow	1	0.999775	0.99042
Bethel	1	1	0.999805
Billings	1	1	1
Boston	1	1	0.99994
Chicago	1	1	1
Cleveland	1	1	1
Cold Bay	1	0.999917	0.964675
Dallas	1	1	1
Denver	1	1	0.999867
Fairbanks	1	0.999994	0.999986
Gander	0.999105	0.99853	0.972881
Goose Bay	0.999227	0.998955	0.997989
Houston	1	1	1
Iqaluit	0.998476	0.995392	0.945323
Jacksonville	1	1	0.999932
Juneau	1	1	1
Kansas City	1	1	1
Kotzebue	1	0.999823	0.996903
Los Angeles	1	1	1
Memphis	1	1	1
Merida	1	0.998525	0.996841
Mexico City	0.999817	0.999779	0.978731
Miami	1	1	0.999347
Minneapolis	1	1	1
New York	1	1	0.999998
Oakland	1	0.999883	0.992323
Puerto Vallarta	0.998992	0.993716	0.92408
Salt Lake City	1	1	1
San Jose Del Cabo	0.999739	0.992998	0.971531
Seattle	1	0.999947	0.999945
Washington DC	0.999992	0.999992	0.999971
Winnipeg	1	1	0.999987

Table 3-3 NPA Availability

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

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

Location	LP Outages	LP Outage Rates	LPV Outages	LPV Outage Rates	LPV 200 Outages	LPV 200 Outage Rates
Arcata	0	0	11	0.000246	88	0.001999
Atlantic City - a	0	0	0	0	13	0.000087
Grand Forks	0	0	0	0	0	0
Oklahoma City	0	0	0	0	0	0
Albuquerque	0	0	0	0	1	0.000019
Anchorage	0	0	0	0	1	0.000019
Atlanta	0	0	0	0	0	0
Barrow	0	0	5	0.000096	122	0.002377
Bethel	0	0	0	0	4	0.000077
Billings	0	0	0	0	0	0
Boston	0	0	0	0	1	0.000019
Chicago	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0
Cold Bay	0	0	2	0.000039	284	0.005681
Dallas	0	0	0	0	0	0
Denver	0	0	0	0	2	0.000039
Fairbanks	0	0	1	0.000019	2	0.000039
Gander	2	0.000039	9	0.000174	231	0.004581
Goose Bay	1	0.000019	2	0.000039	8	0.000155
Houston	0	0	0	0	0	0
Iqaluit	14	0.000277	83	0.001648	440	0.009199
Jacksonville	0	0	0	0	1	0.000019
Juneau	0	0	0	0	0	0
Kansas City	0	0	0	0	0	0
Kotzebue	0	0	4	0.000077	40	0.000774
Los Angeles	0	0	0	0	0	0
Memphis	0	0	0	0	0	0
Merida	0	0	48	0.000928	61	0.001181
Mexico City	5	0.000096	7	0.000135	504	0.009934
Miami	0	0	0	0	4	0.000077
Minneapolis	0	0	0	0	0	0
New York	0	0	0	0	1	0.000019
Oakland	0	0	1	0.000019	96	0.001866
Puerto Vallarta	13	0.000251	84	0.001631	474	0.009899
Salt Lake City	0	0	0	0	0	0
San Jose Del Cabo	6	0.000116	94	0.001827	232	0.004608
Seattle	0	0	1	0.000019	1	0.000019
Washington DC	1	0.000019	1	0.000019	3	0.000058
Winnipeg	0	0	0	0	1	0.000019

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

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

Figure 3-1 LPV Instantaneous Availability

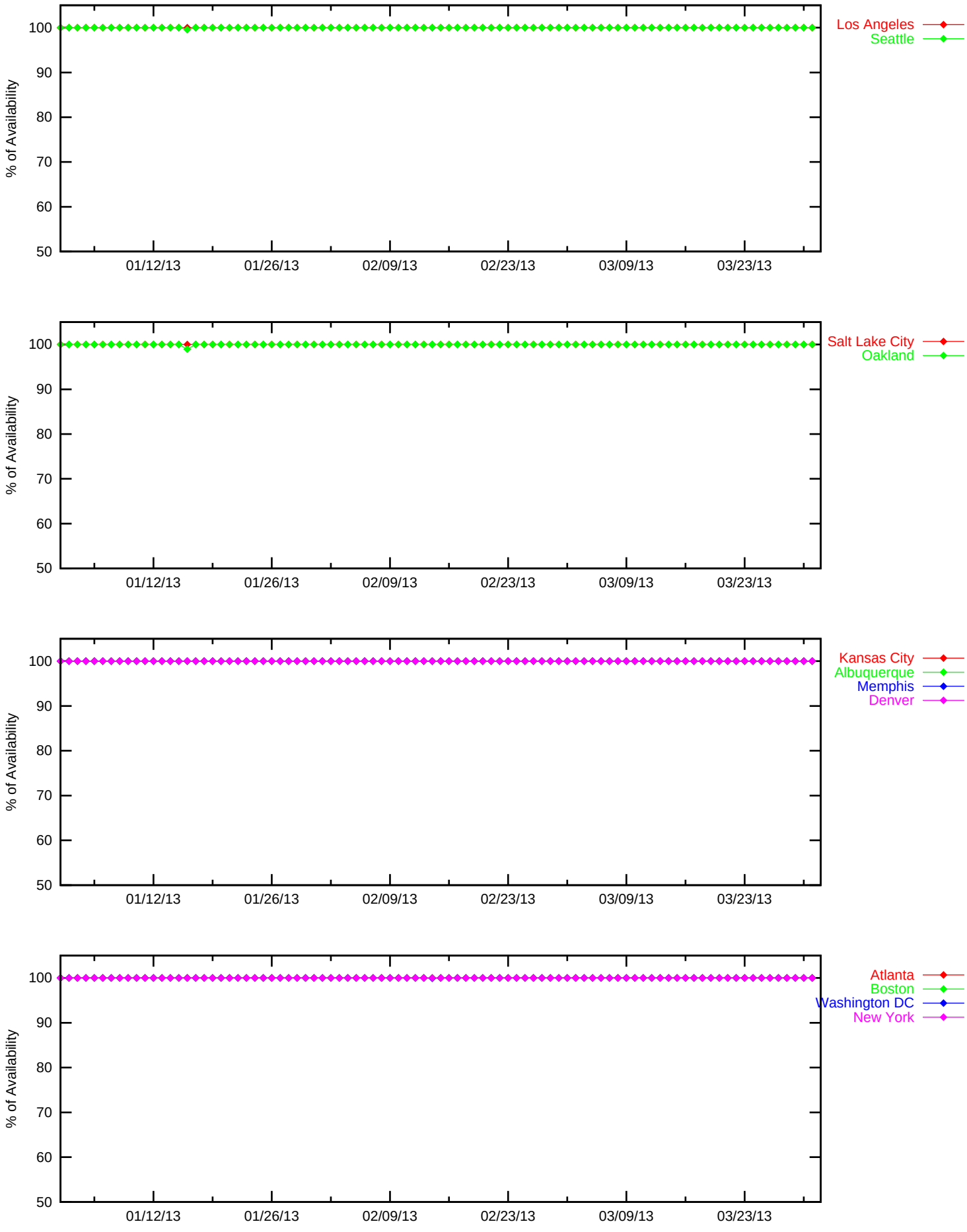
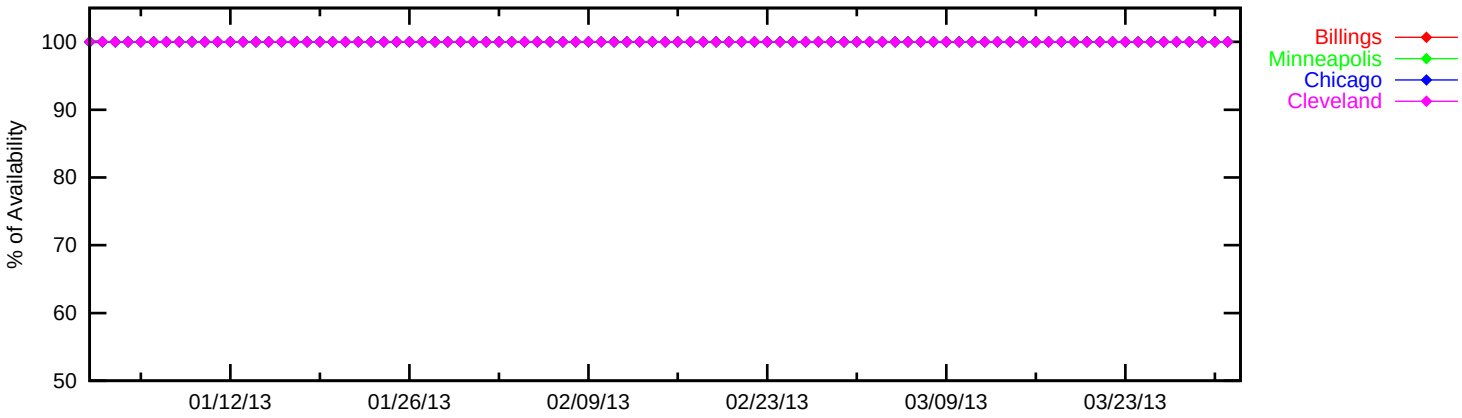
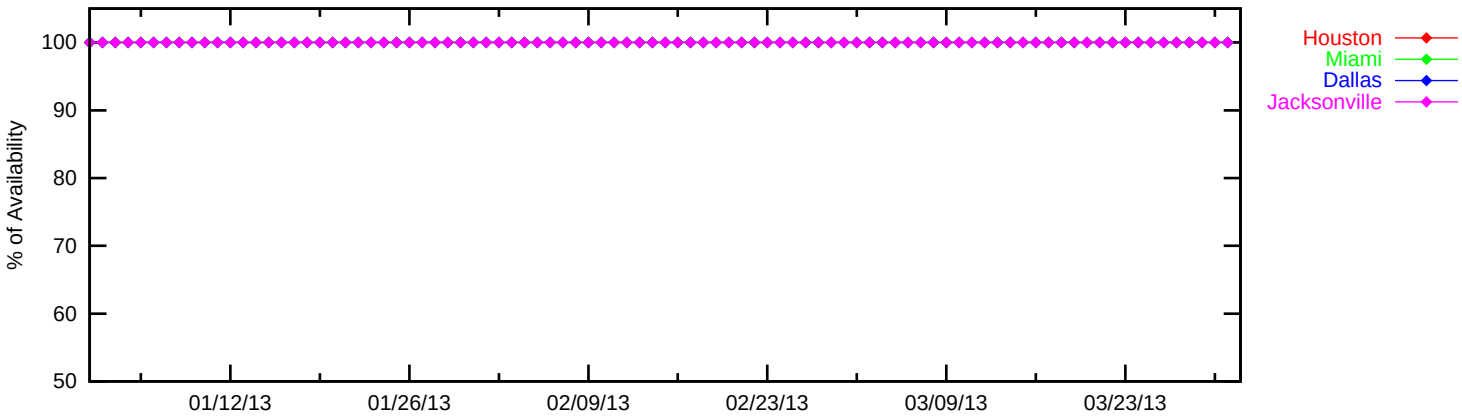
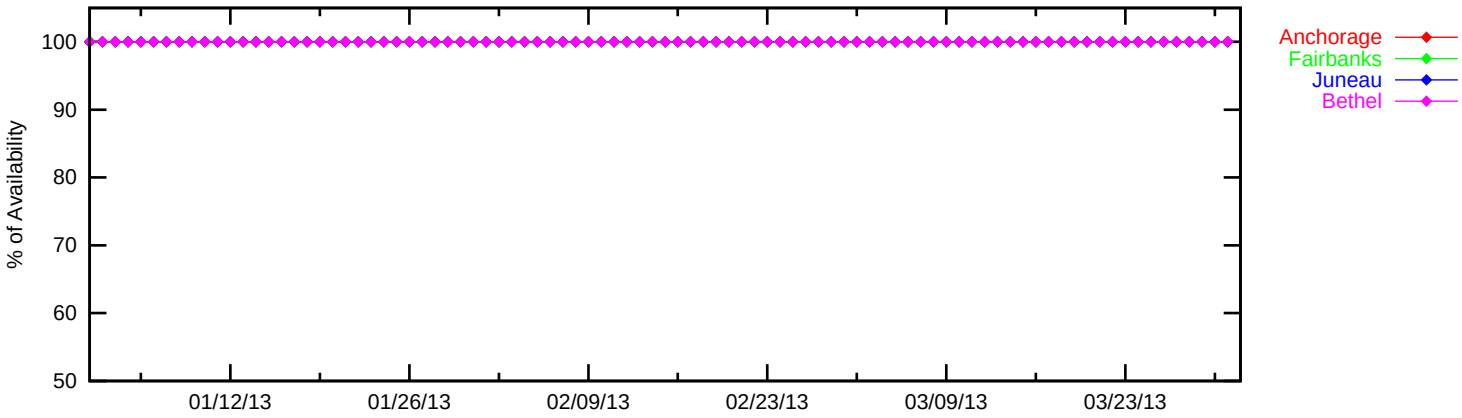


Figure 3-2 LPV Instantaneous Availability







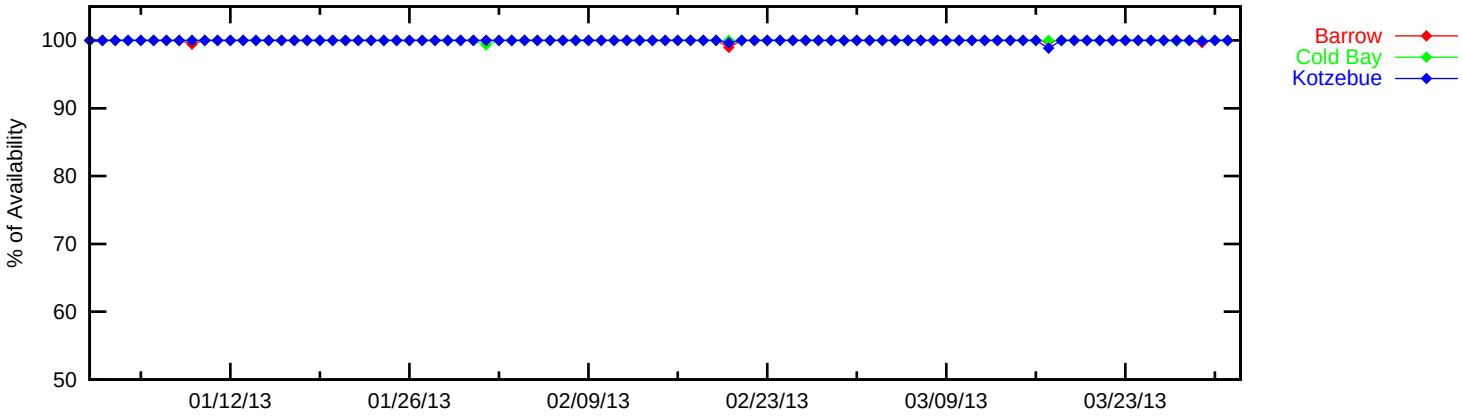


Figure 3-3 LPV Instantaneous Availability

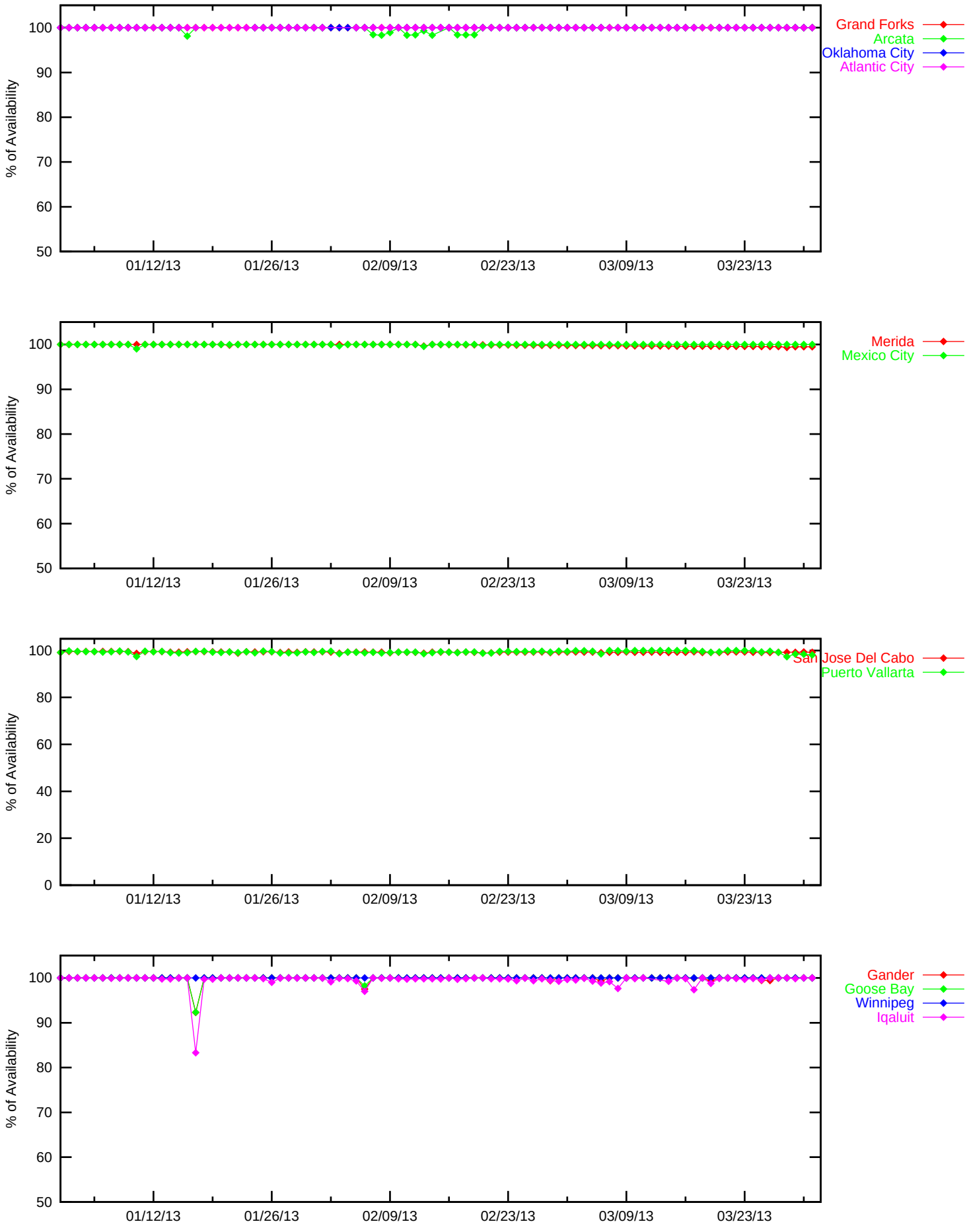
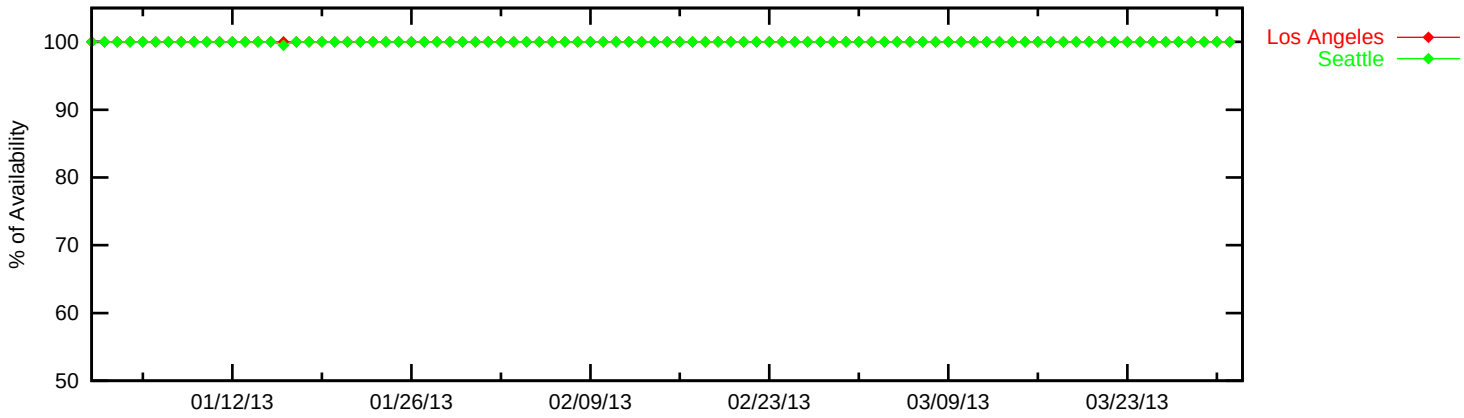
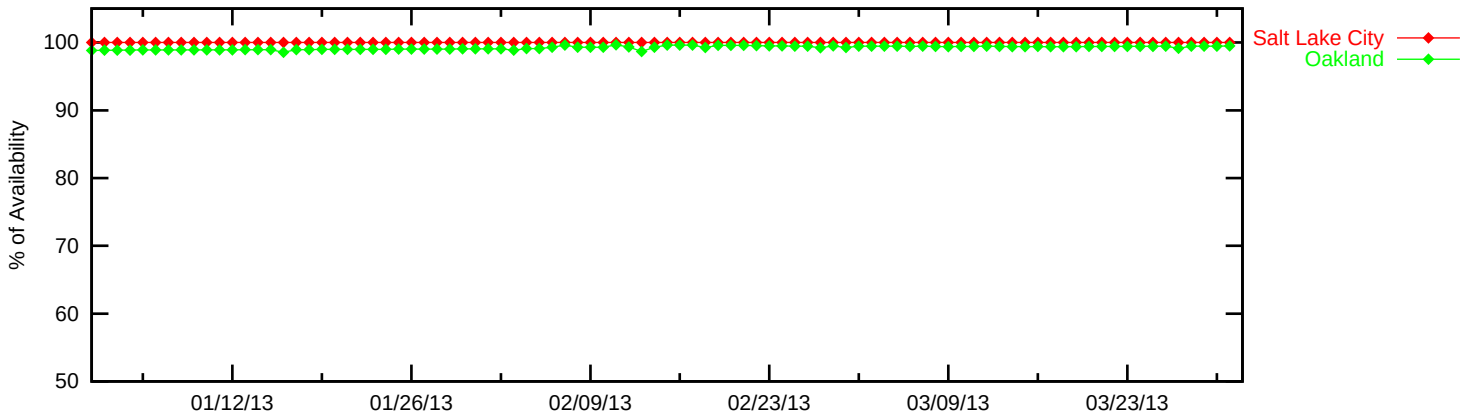
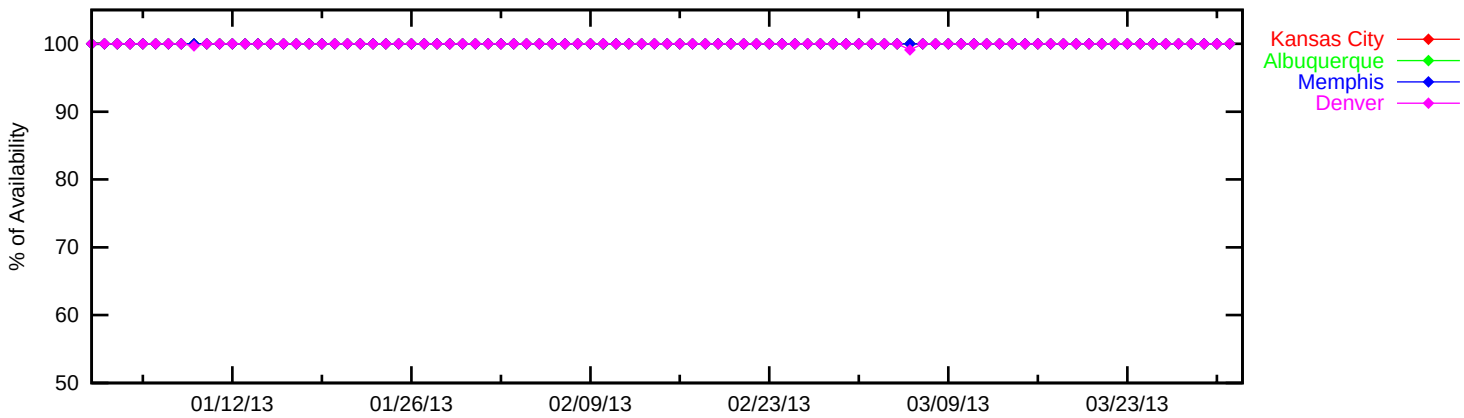


Figure 3-4 LPV 200 Instantaneous Availability







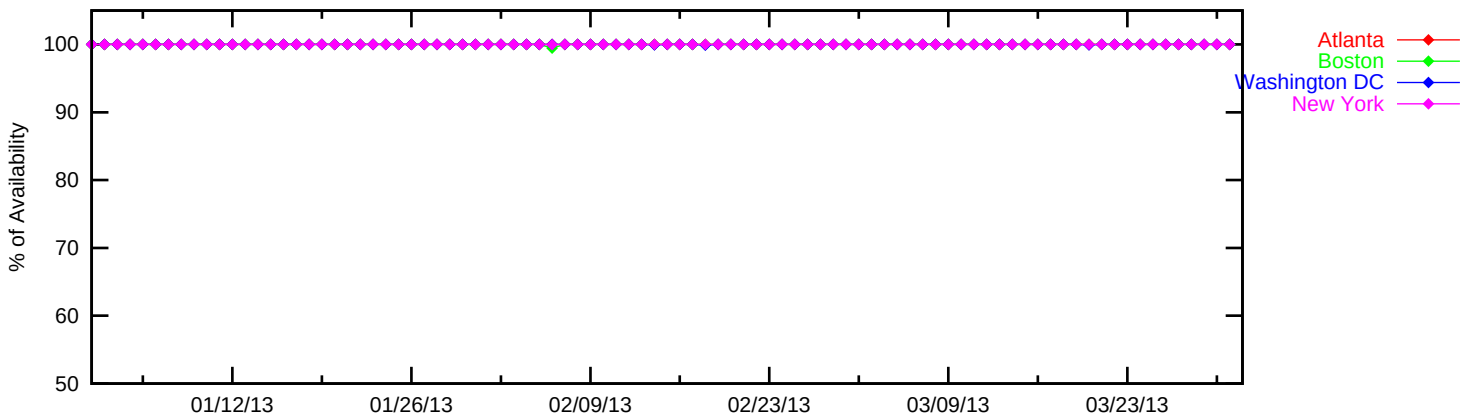


Figure 3-5 LPV 200 Instantaneous Availability

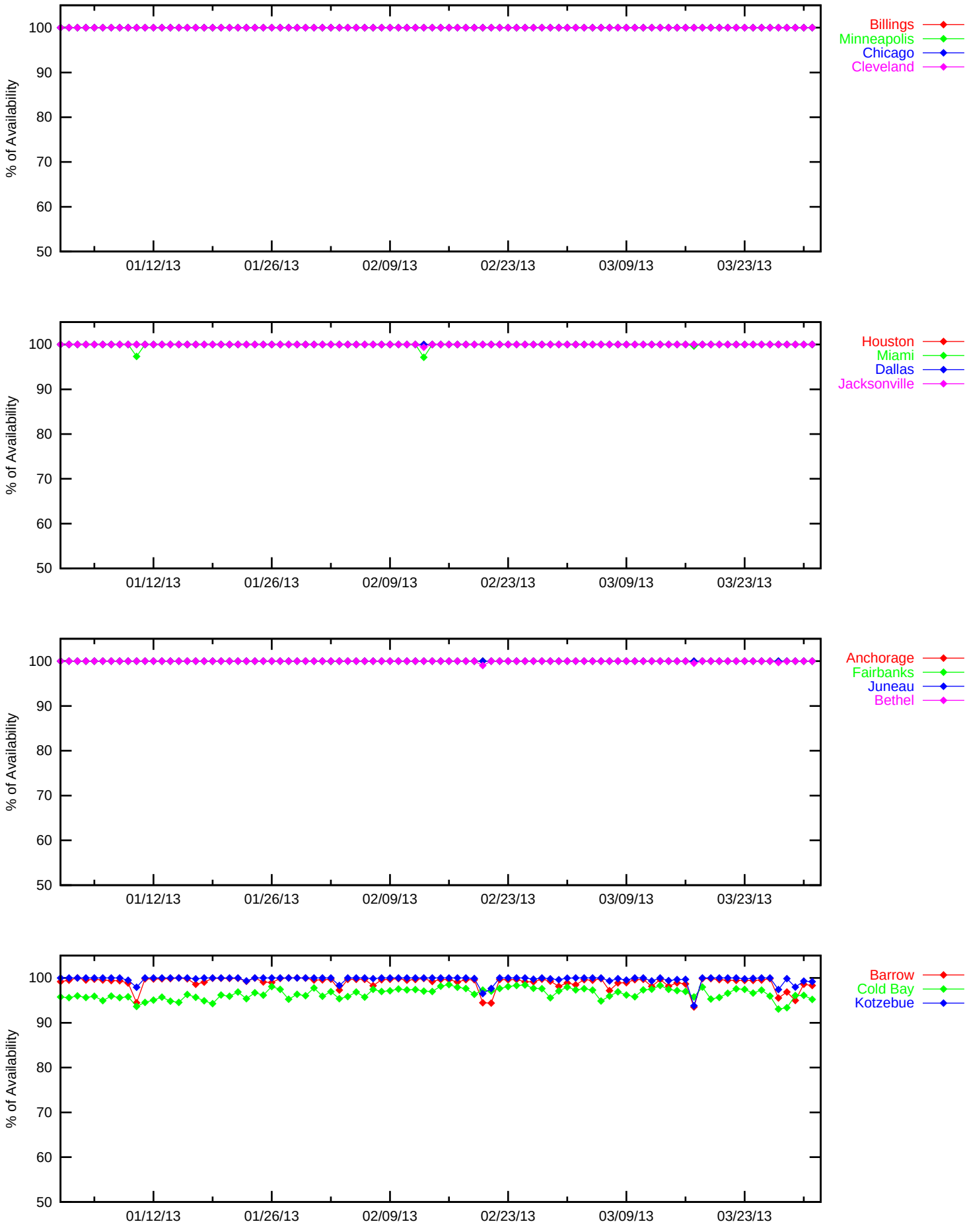
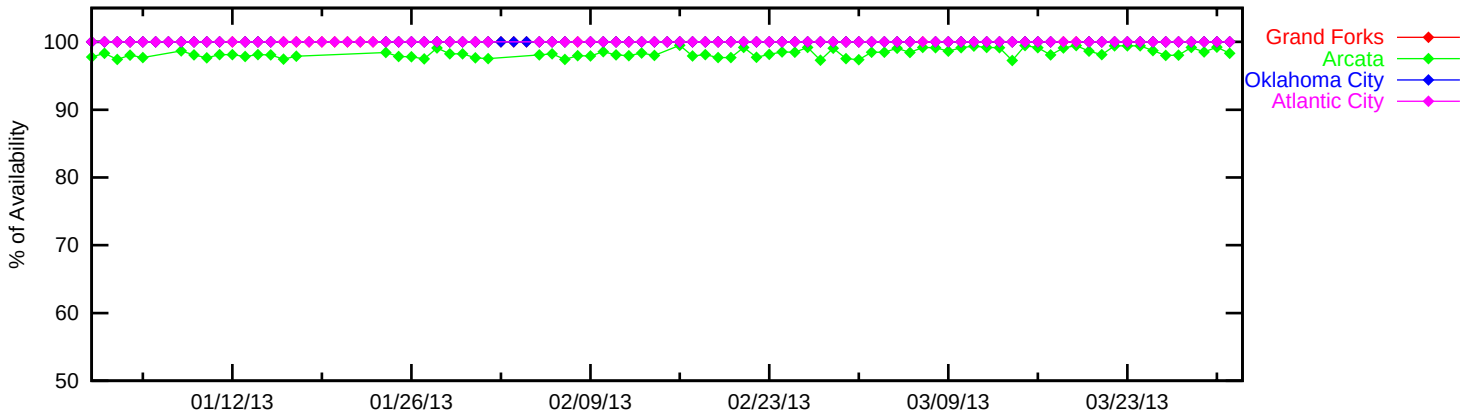
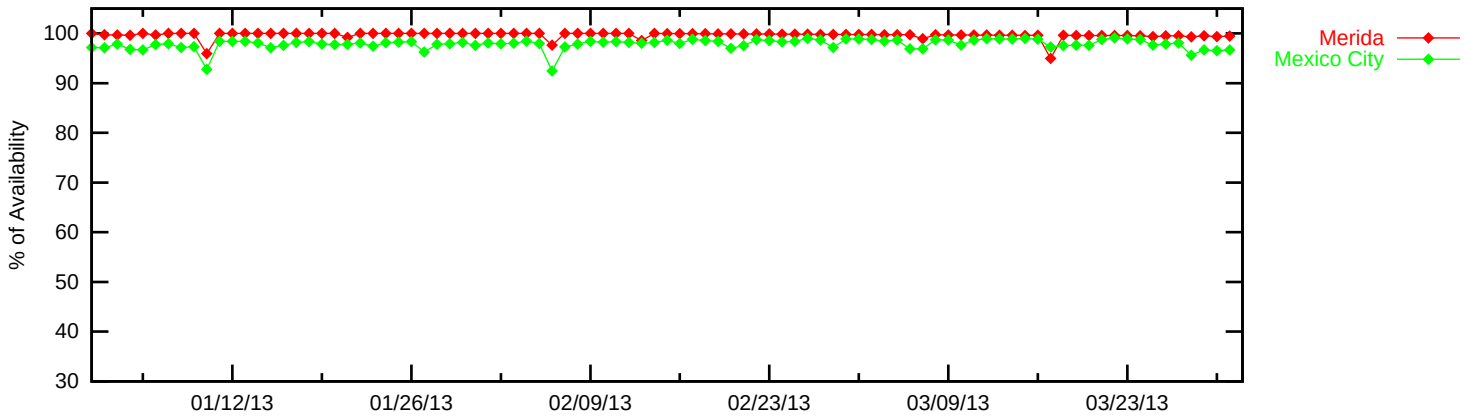
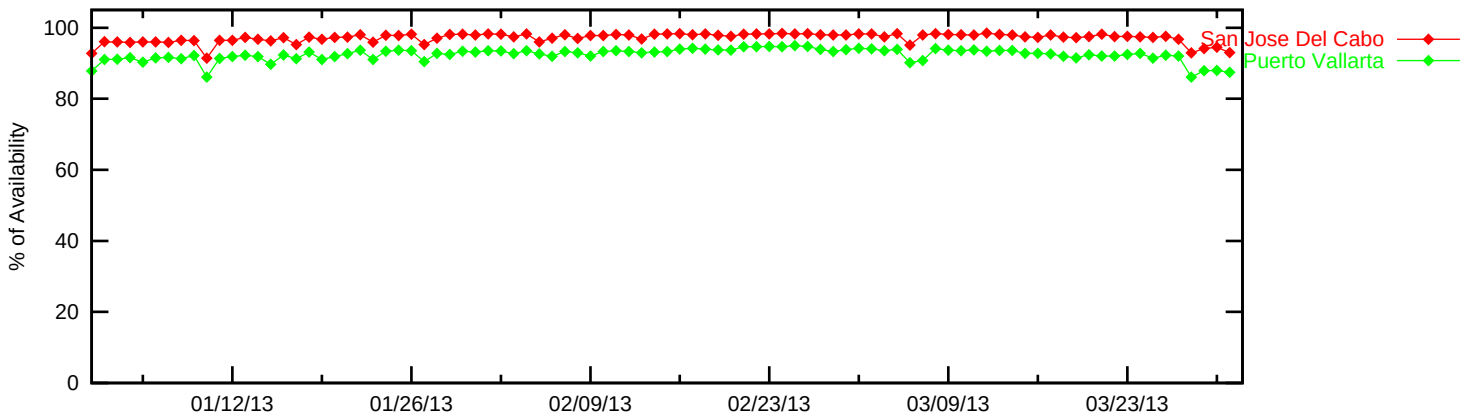


Figure 3-6 LPV 200 Instantaneous Availability







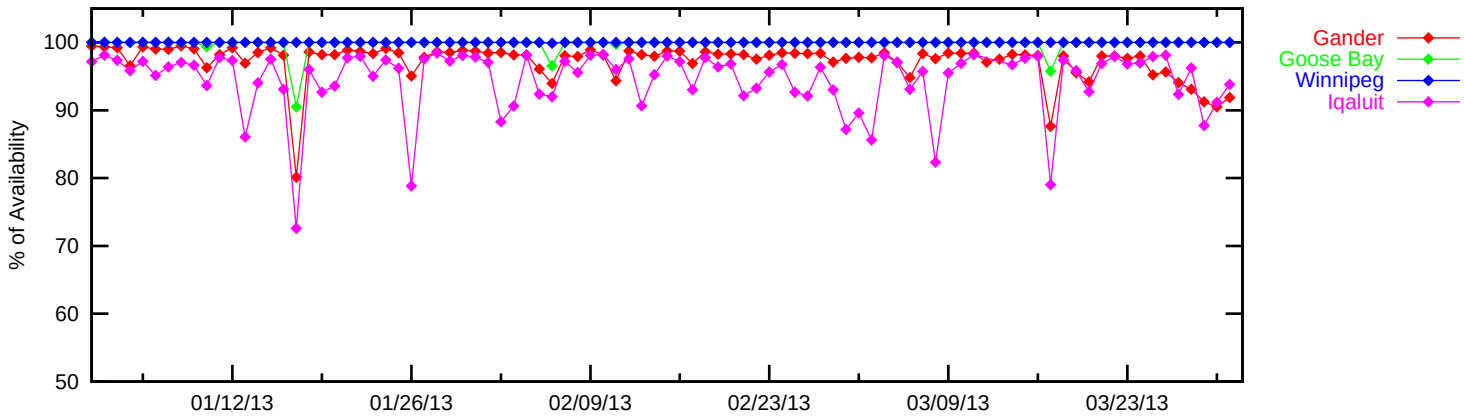


Figure 3-7 LPV Outages

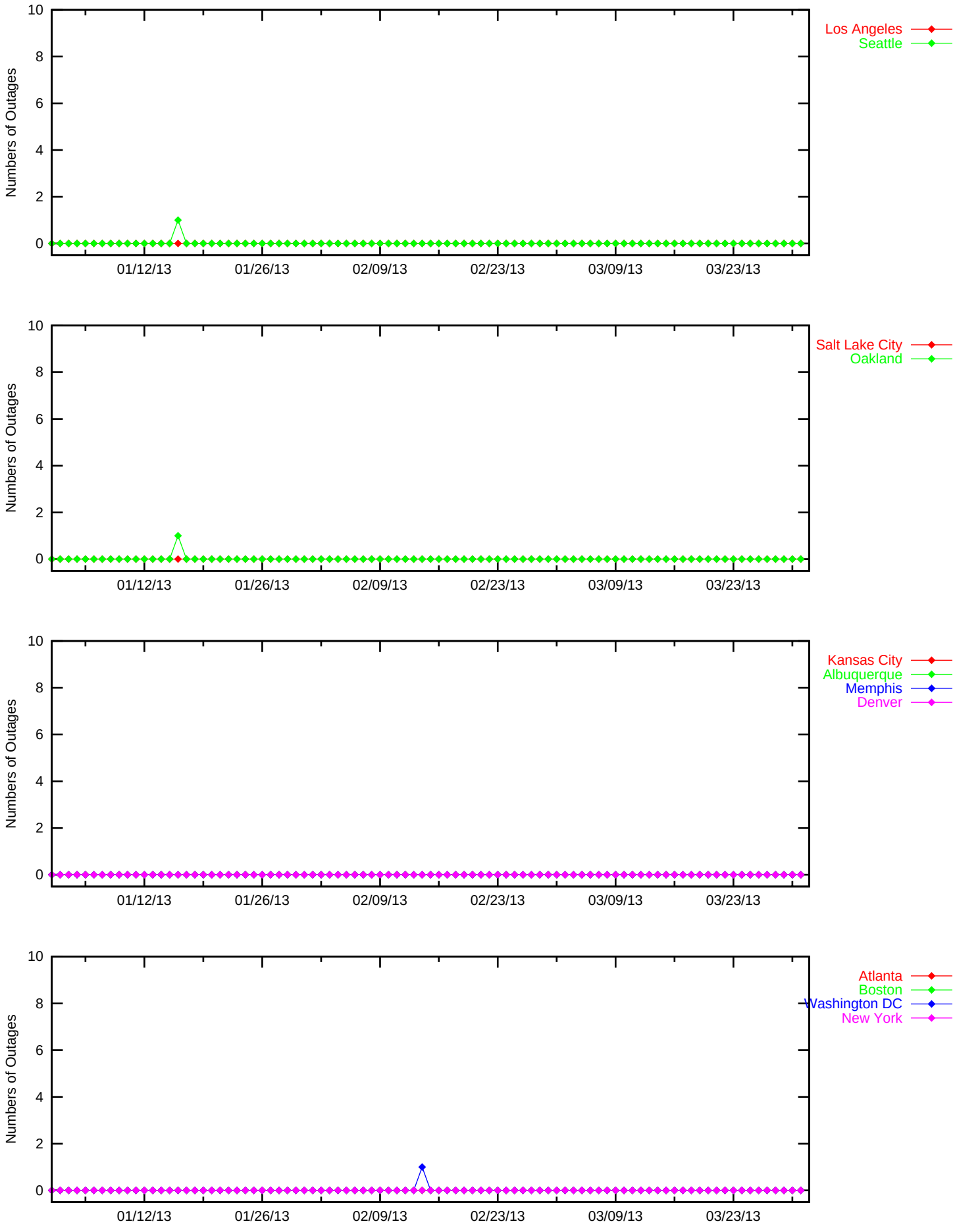
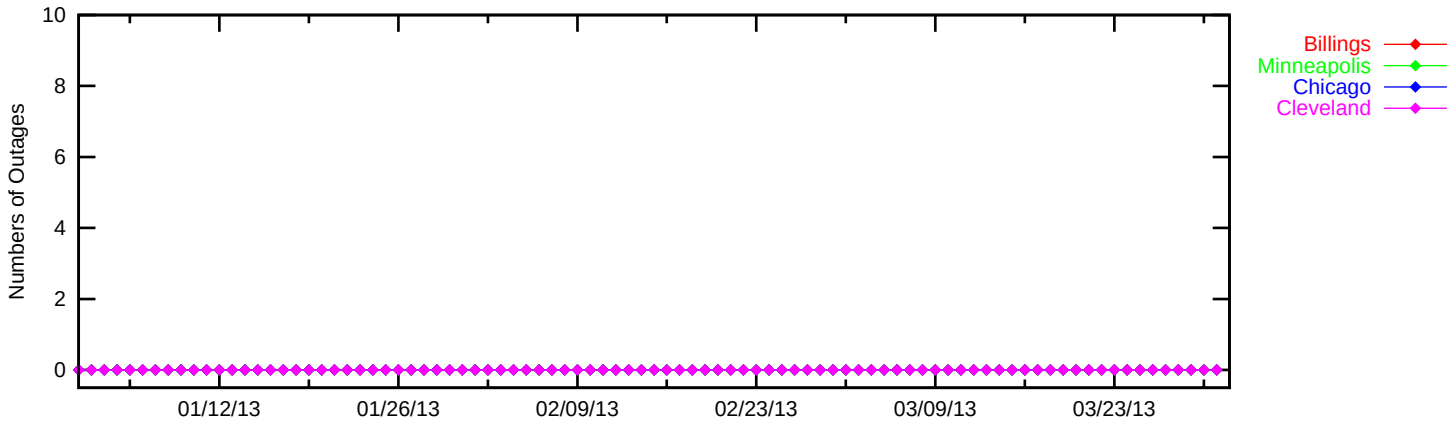
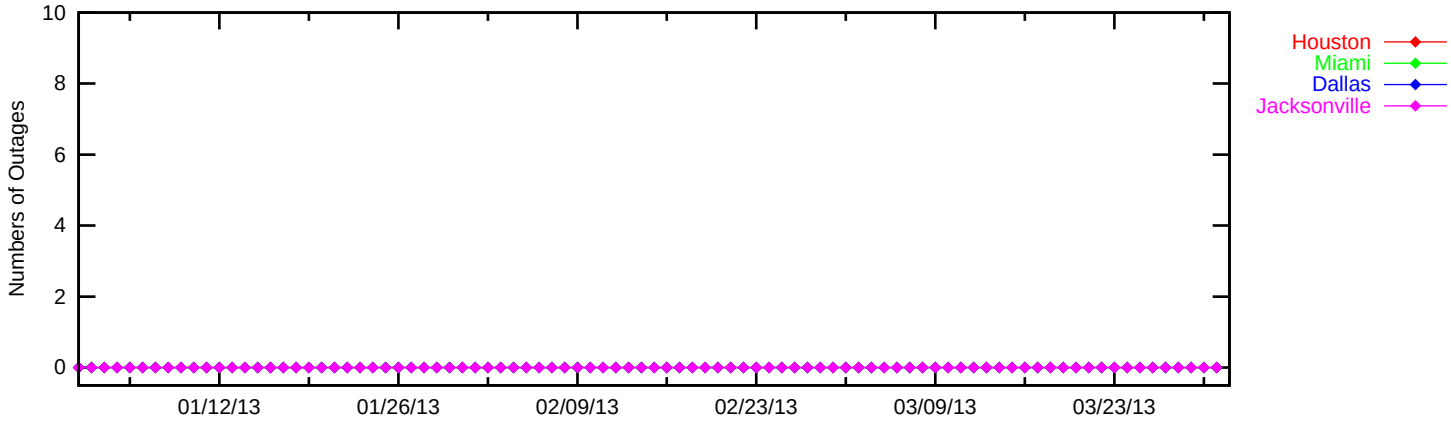
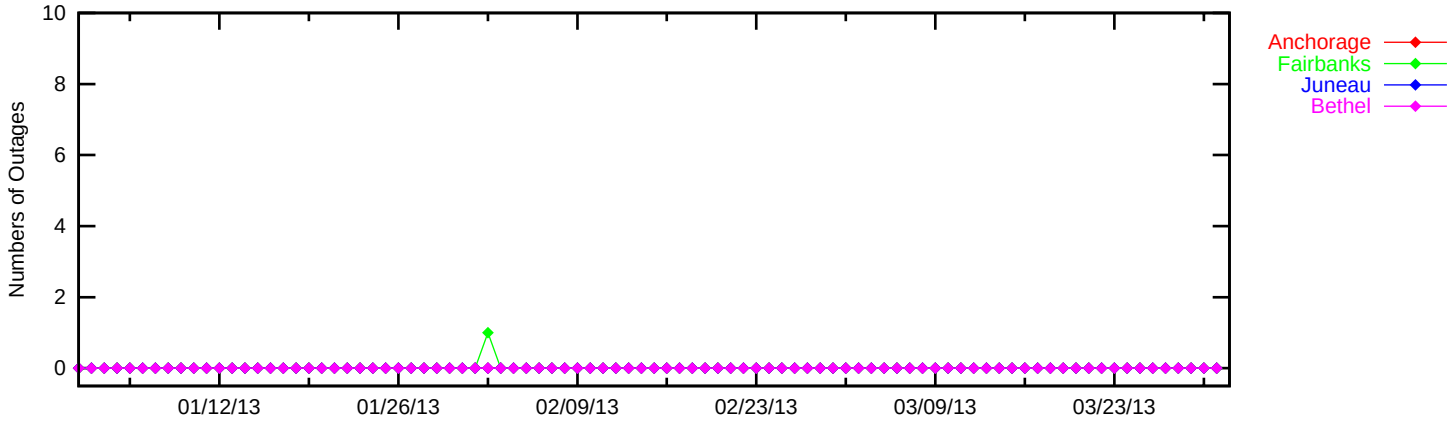


Figure 3-8 LPV Outages







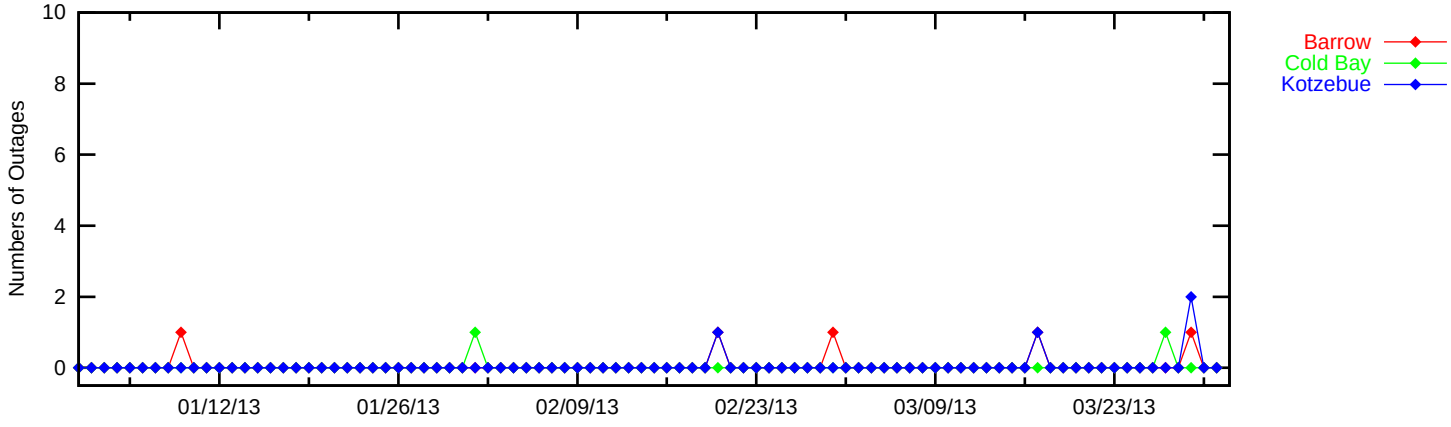


Figure 3-9 LPV Outages

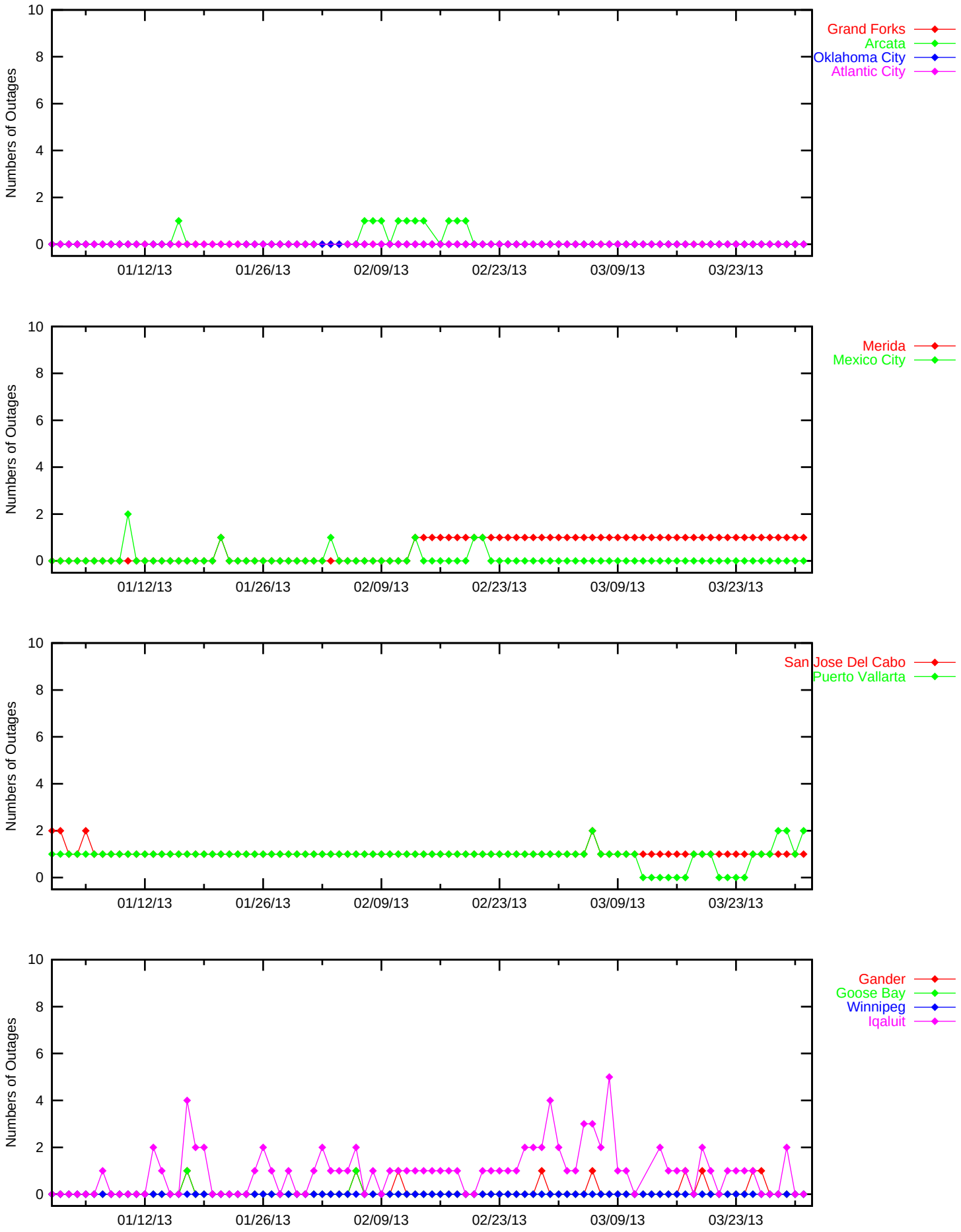


Figure 3-10 LPV 200 Outages

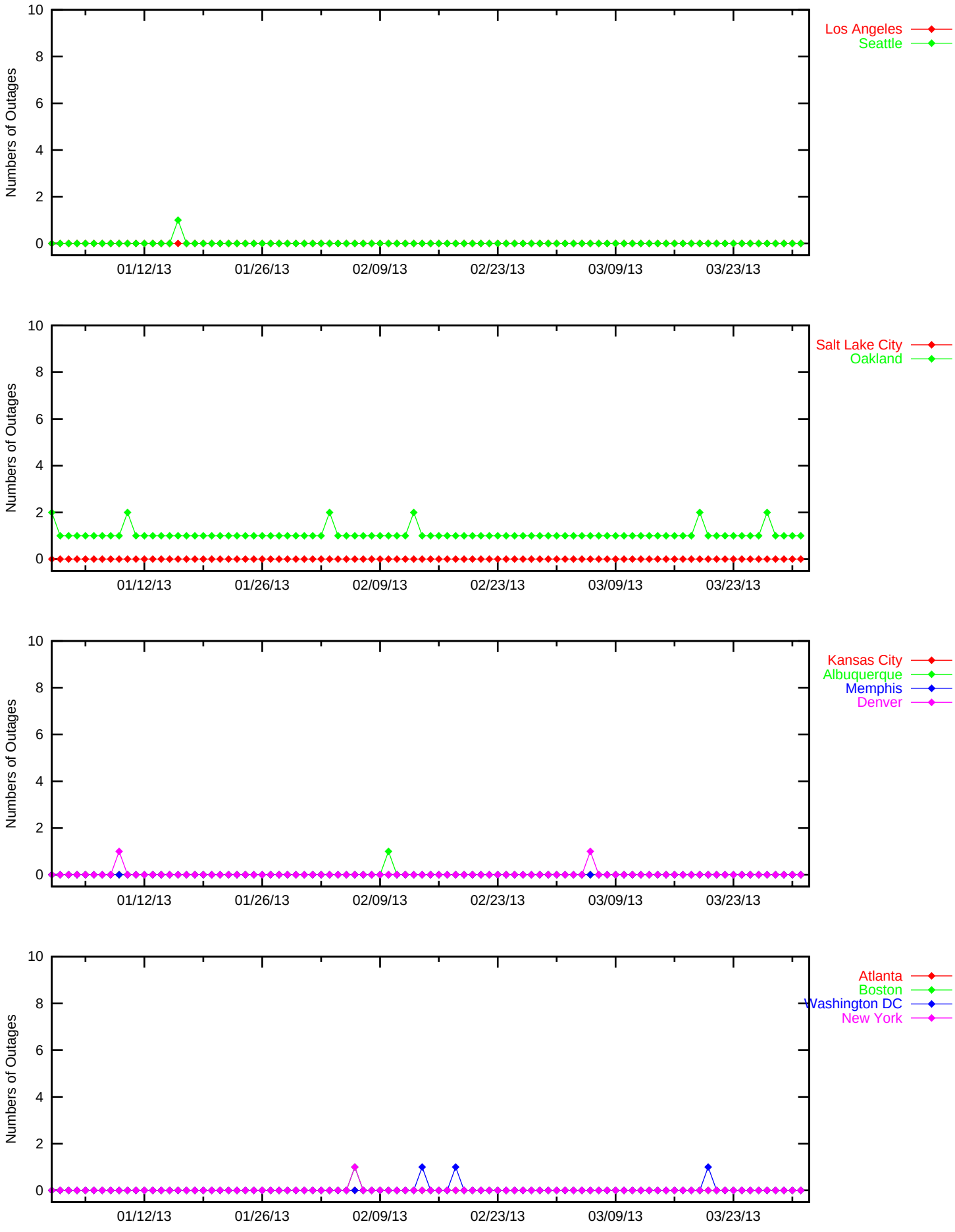


Figure 3-11 LPV 200 Outages

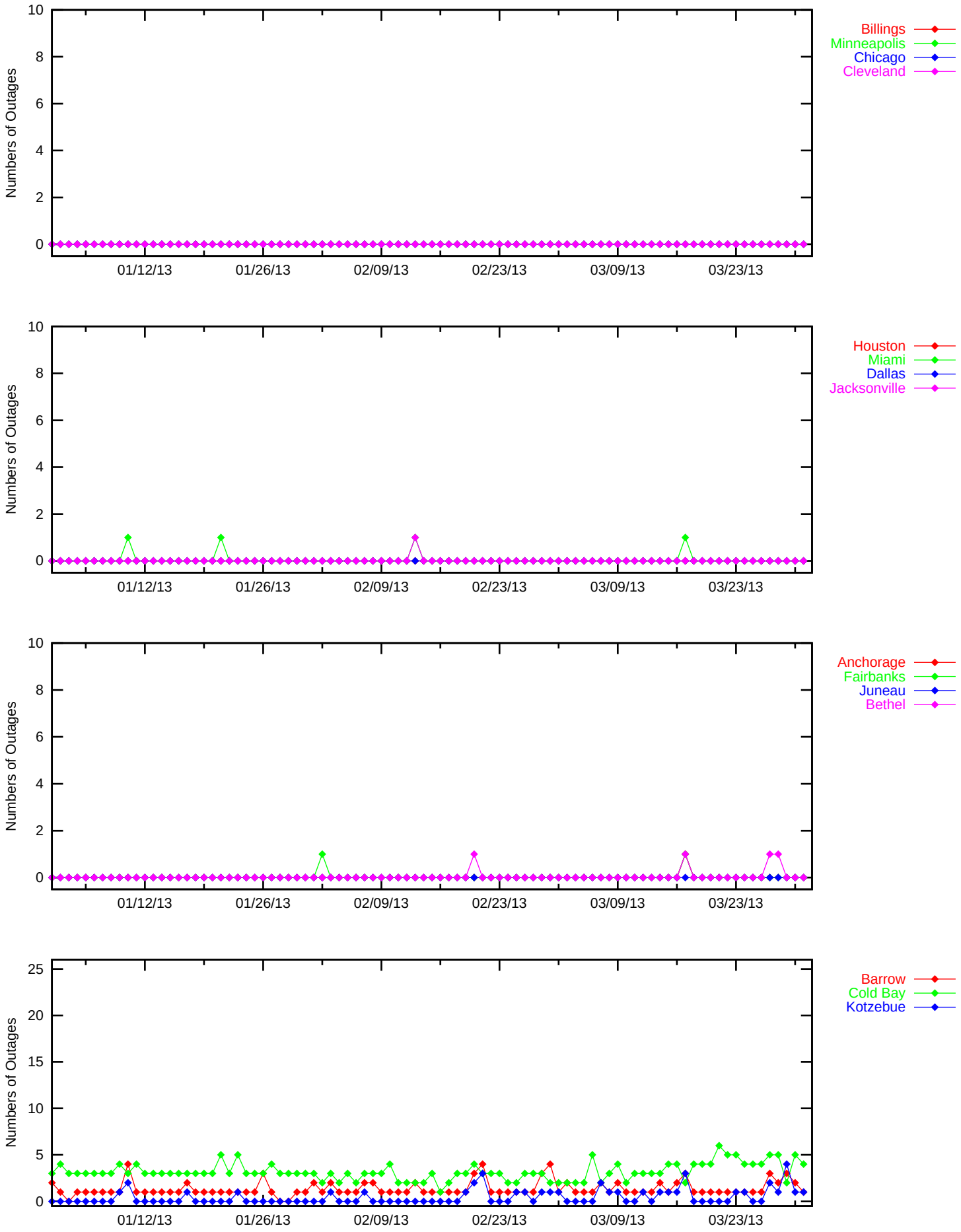
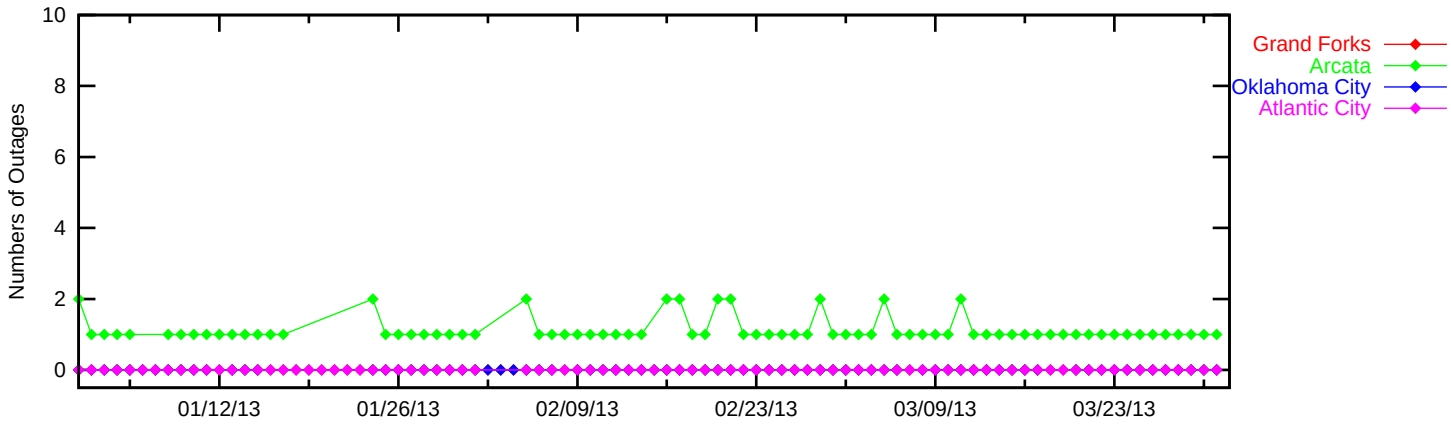
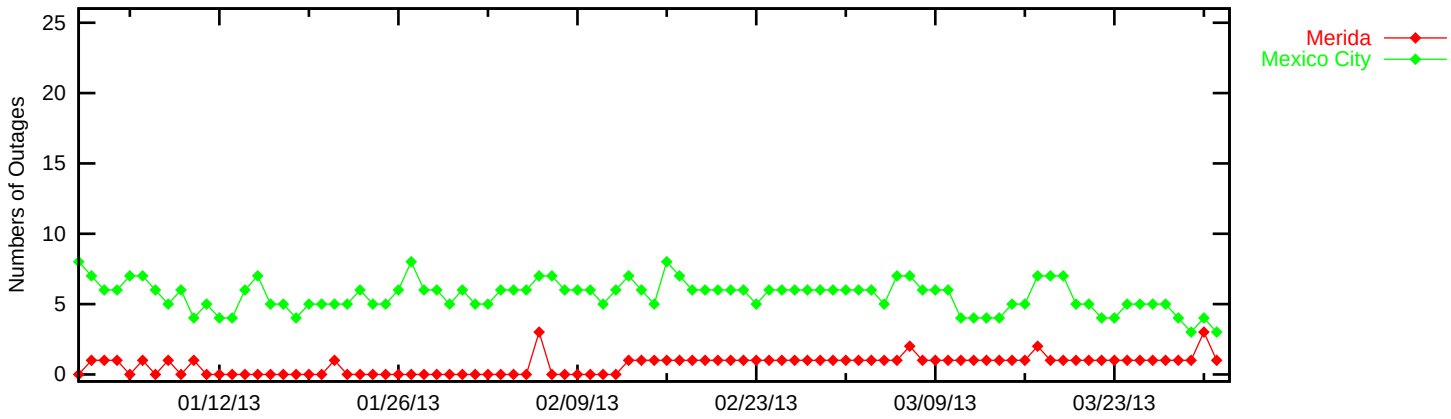
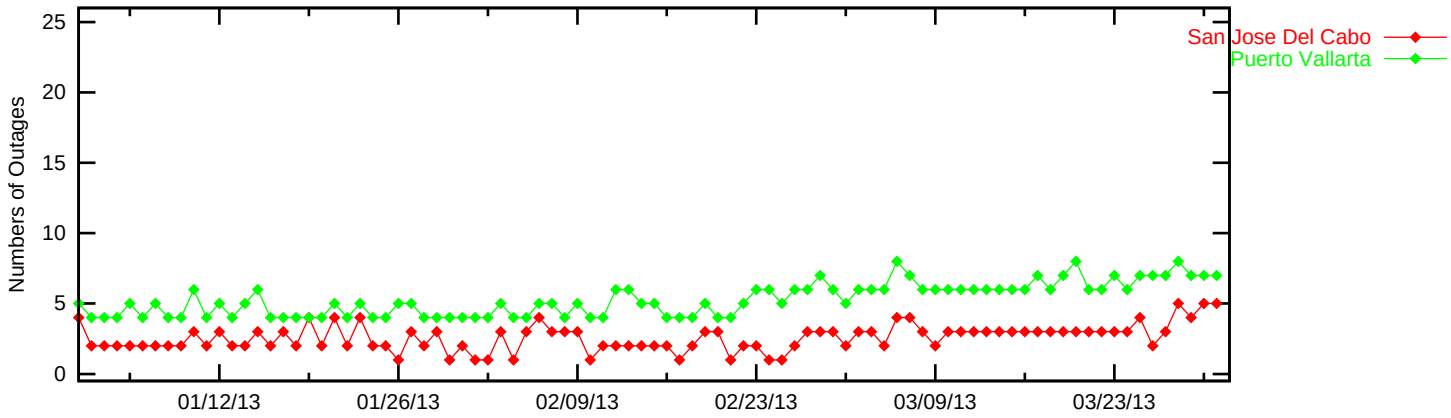
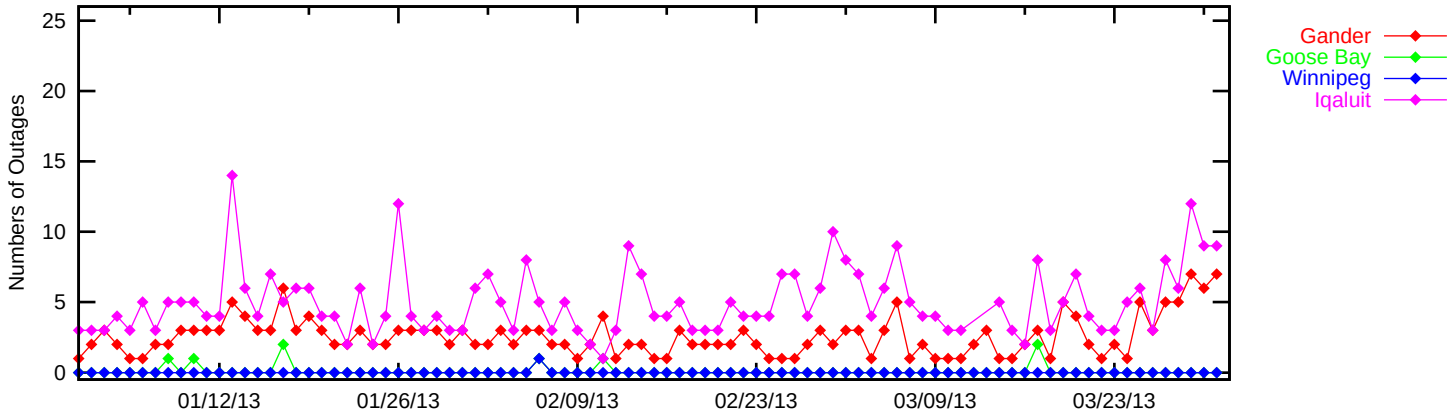


Figure 3-12 LPV 200 Outages









4.0 COVERAGE

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

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

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

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

Minor degradation in coverage in Alaska and Canada was observed after March 27th due to PRN-30 removal from service until further notice.

Manual GUS switchover on CRW GEO (PRN-135) on January 9th and February 20th elevated UDRE values and reduced Alaska coverage. Manual CnV source select change on all 3 GEOs on March 27th in preparation for maintenance caused increased UDRE values on all three GEOs and reduced CONUS, Alaska and Canada coverage.

A brief carrier phase anomaly on PRN-4 on January 21st caused WAAS to issue an SV alert setting PRN 4 to "Not Monitored" slightly affected LPV-200 CONUS and Mexico coverage. A brief carrier phase anomaly on PRN-21 on February 10th caused WAAS to issue a SV alert setting PRN-21 to "Not Monitored" resulted in a minor reduction in LPV-200 CONUS coverage.

Geomagnetic activity on January 17th, January 26th, March 17th and March 29th elevated GIVE values and reduced Alaska and Canada coverage. Geomagnetic activity on January 17th also reduced CONUS coverage. Geomagnetic activity on January 13th, March 1st and March 2nd reduced Canada coverage. Geomagnetic activity on March 29th caused scintillation elevating vertical errors at Alaska and Canada sites with slight effect on coverage; see DR# 113 Ionospheric Scintillation Causes Elevated Vertical Errors at Higher Latittude WAAS Reference Stations.

Planned maintenance on PRN-5 on January 10th affected CONUS, Alaska and Canada coverage. Planned maintenance on PRN-20 on January 16th and 17th reduced CONUS, Alaska and Canada coverage. Planned maintenance on PRN-17 on February 6th affected CONUS, Alaska and Canada coverage. Planned Maintenance on PRN-10 on February 13th slightly decreased CONUS coverage.

Extended communication outages and maintenance at Iqaluit increased GIVE values at northern latitudes due to the loss of data from Iqaluit reference stations and resulted in minor coverage reduction in Canada and Alaska.

Radio frequency interference (RFI) caused localized loss of LPV/LPV200 coverage at Washington, D.C. on February 14th, February 18th, March 20th, and Los Angeles on February 27th, but had no effect on WAAS service.

Figure 4-1 LP North America Coverage for the Quarater

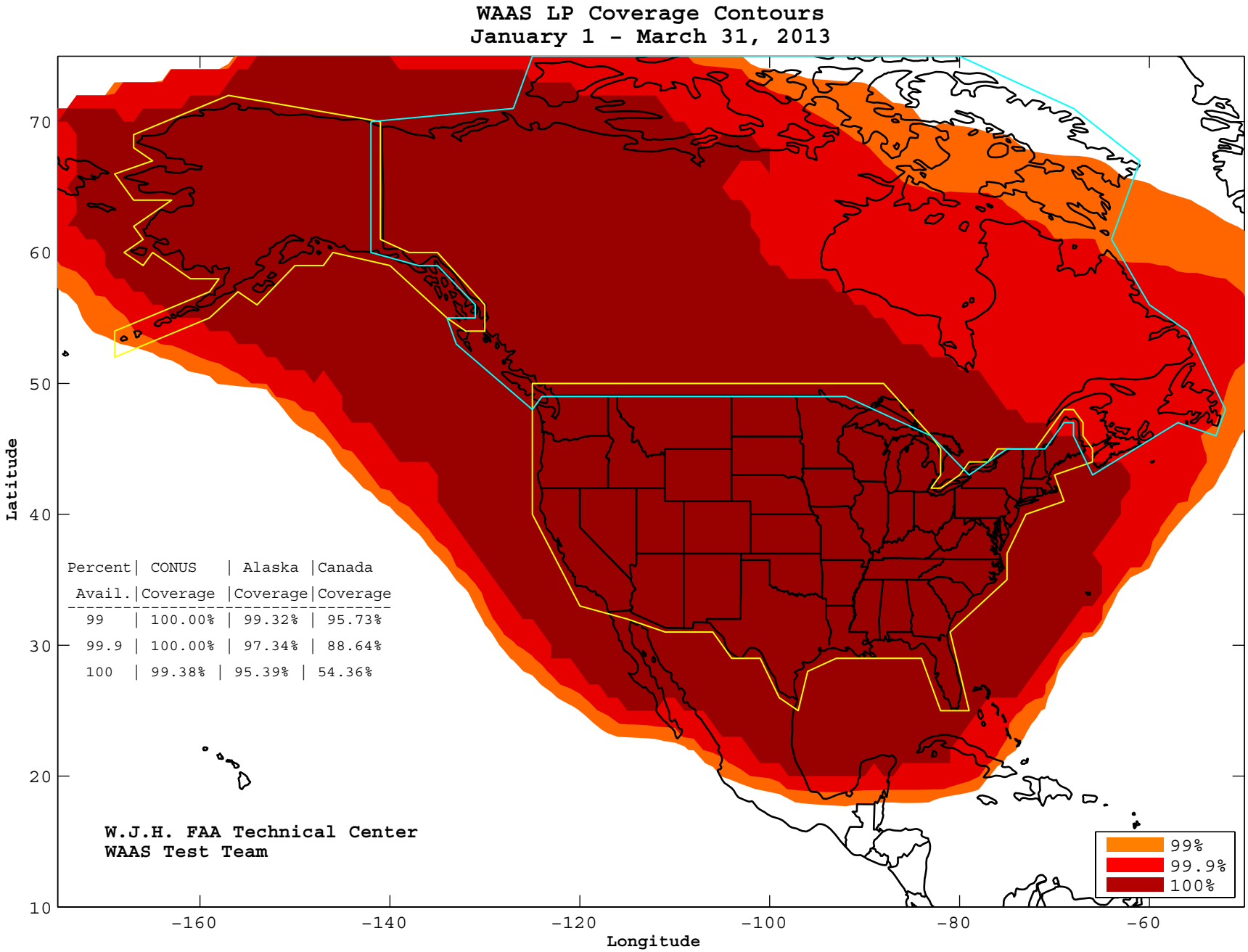


Figure 4-2 LPV North America Coverage for the Quarter

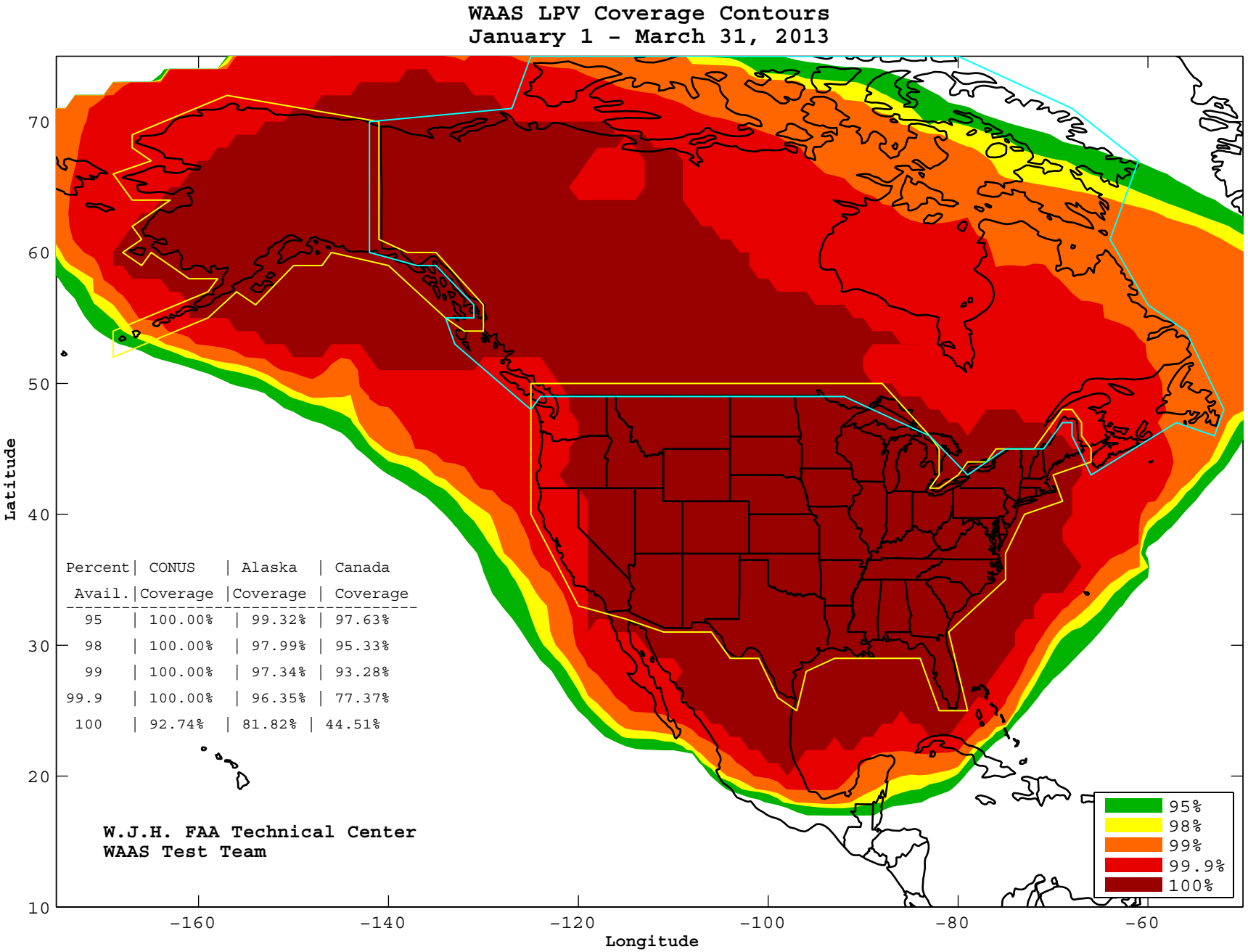


Figure 4-3 LPV 200 North America Coverage for the Quarter

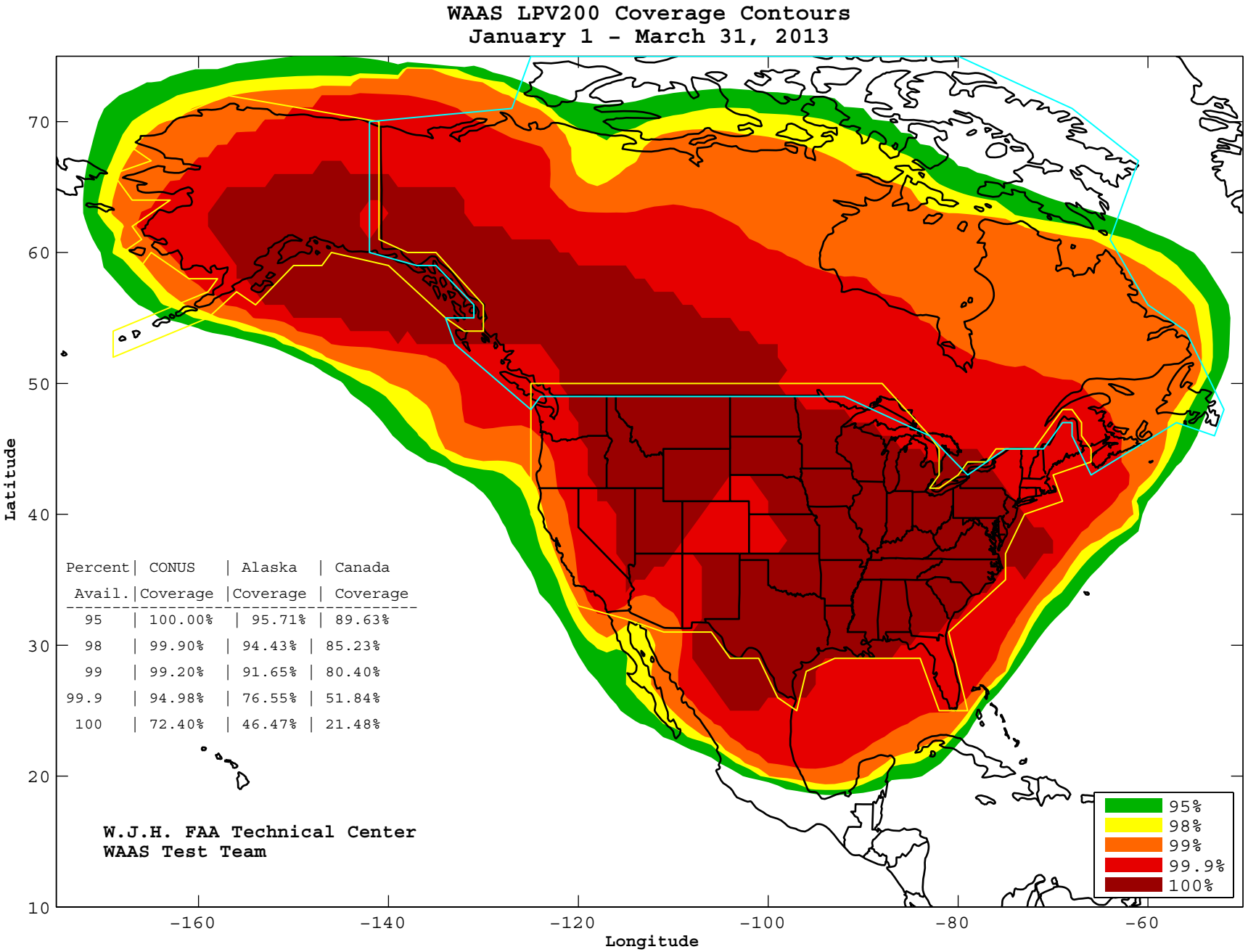


Figure 4-4 RNP 0.1 World Coverage for the Quarter

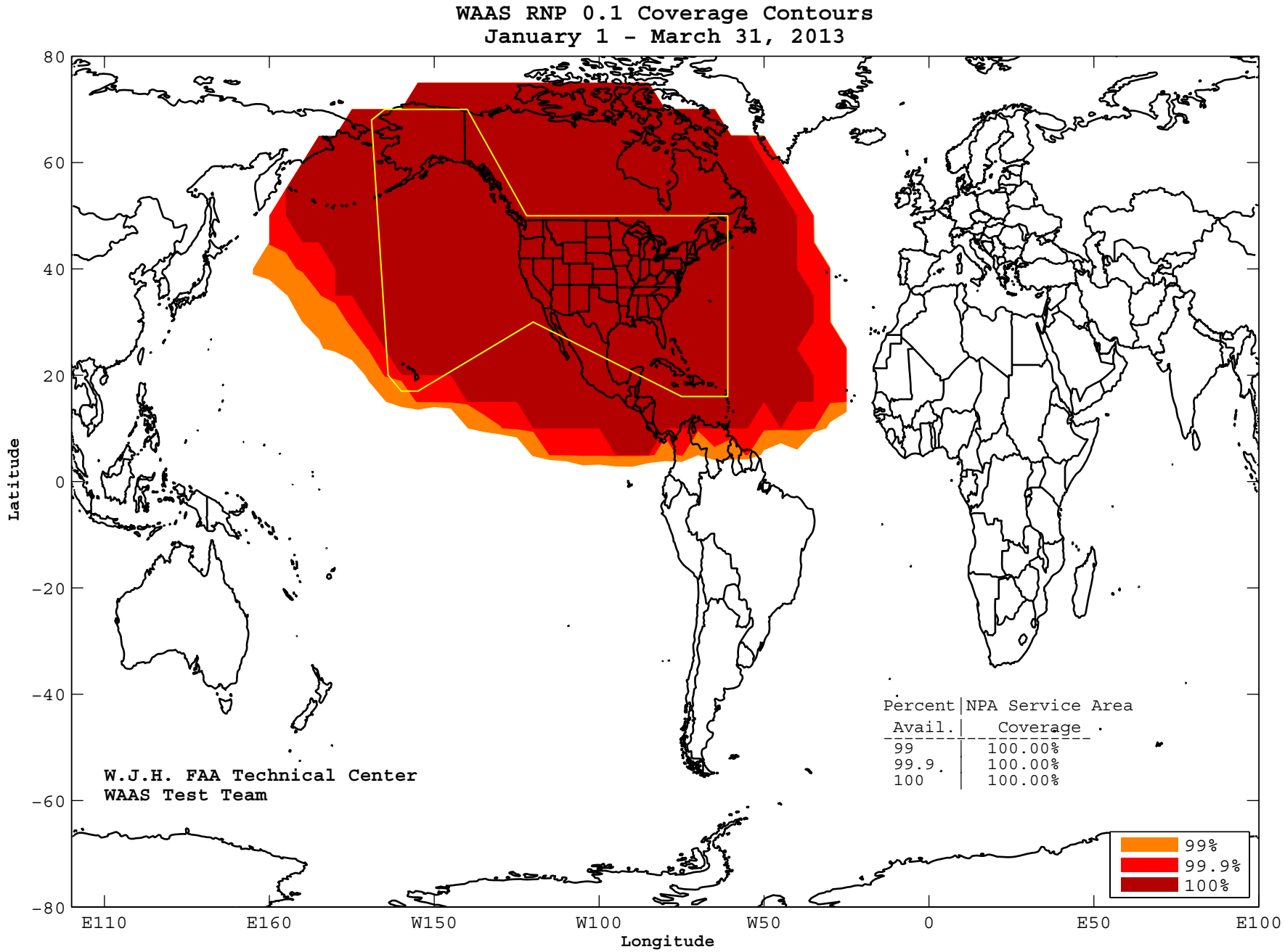


Figure 4-5 RNP 0.3 World Coverage for the Quarter

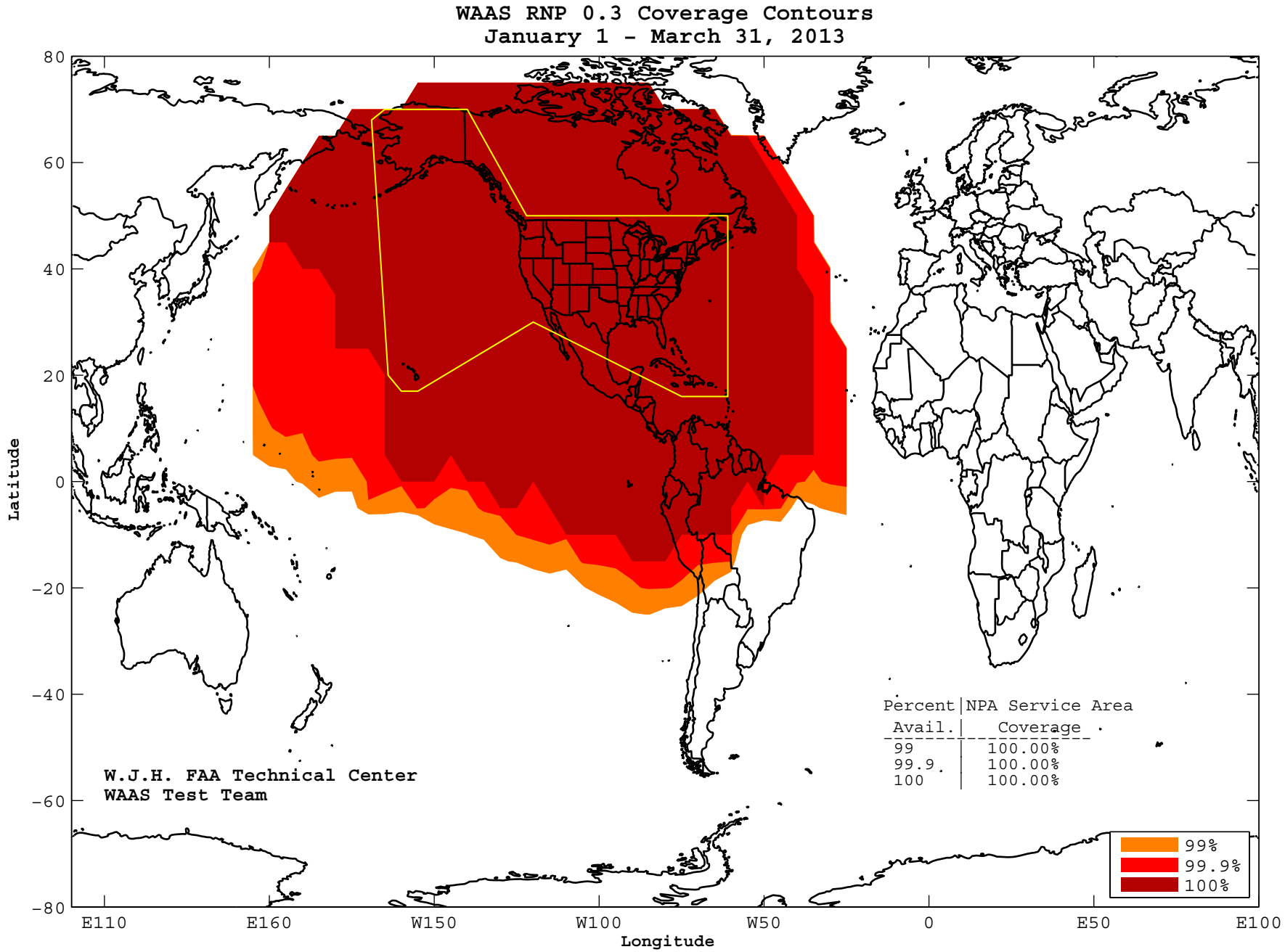


Figure 4-6 Daily LPV and LPV 200 CONUS Coverage

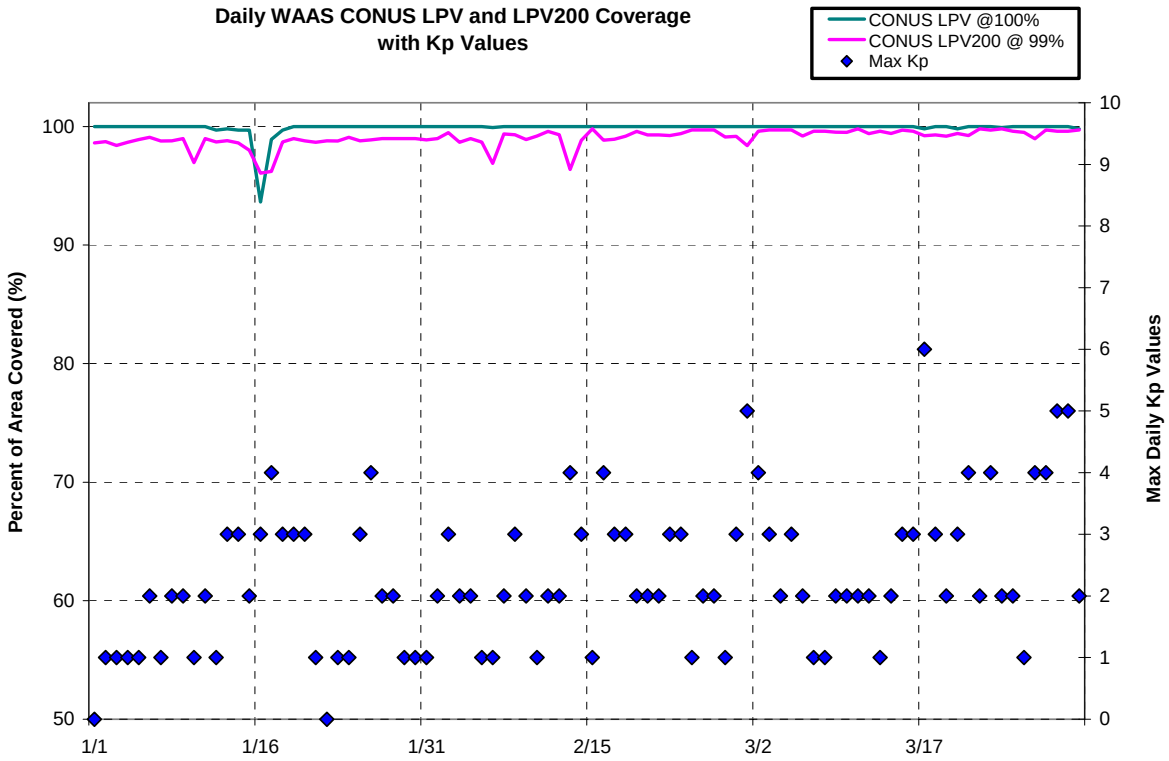


Figure 4-7 Daily LPV and LPV 200 Alaska Coverage

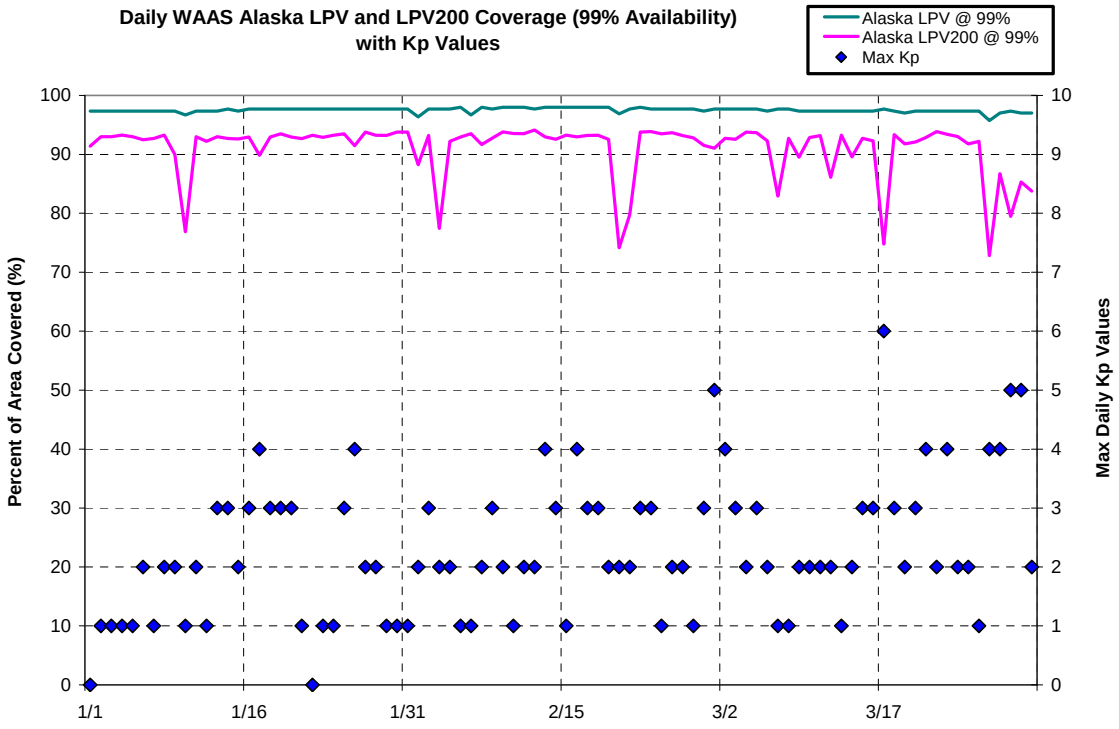


Figure 4-8 Daily LPV and LPV 200 Canada Coverage

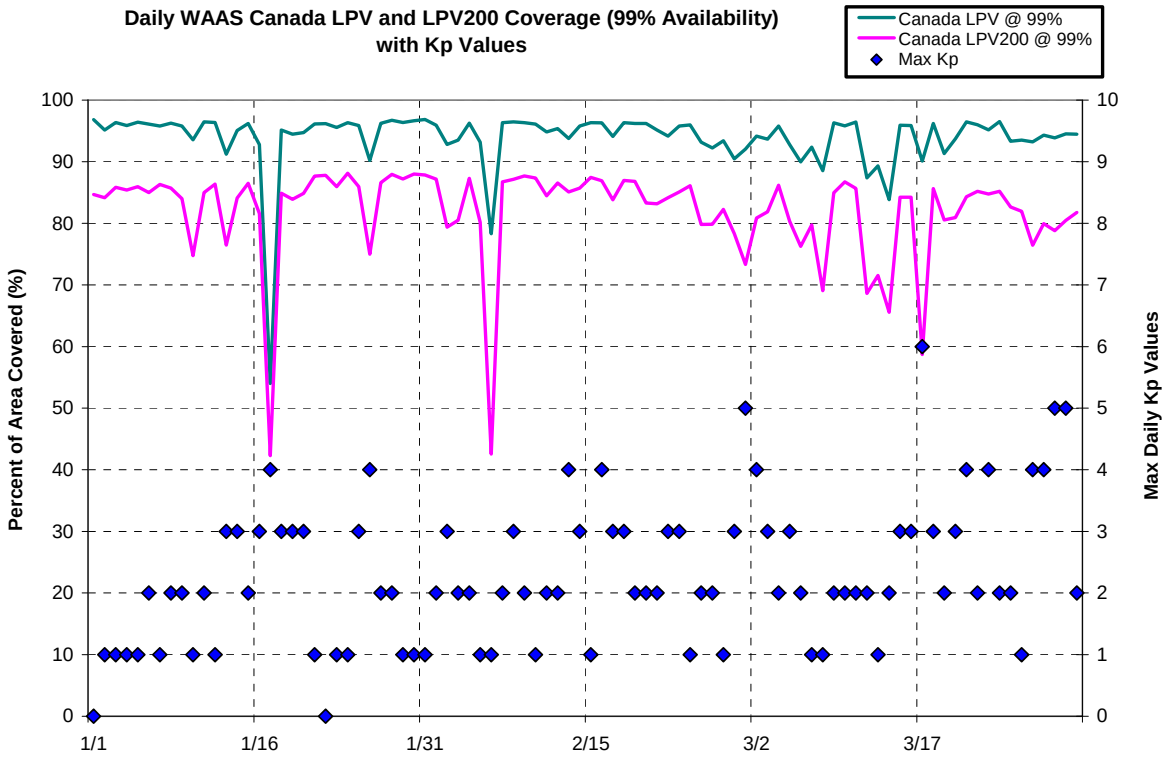
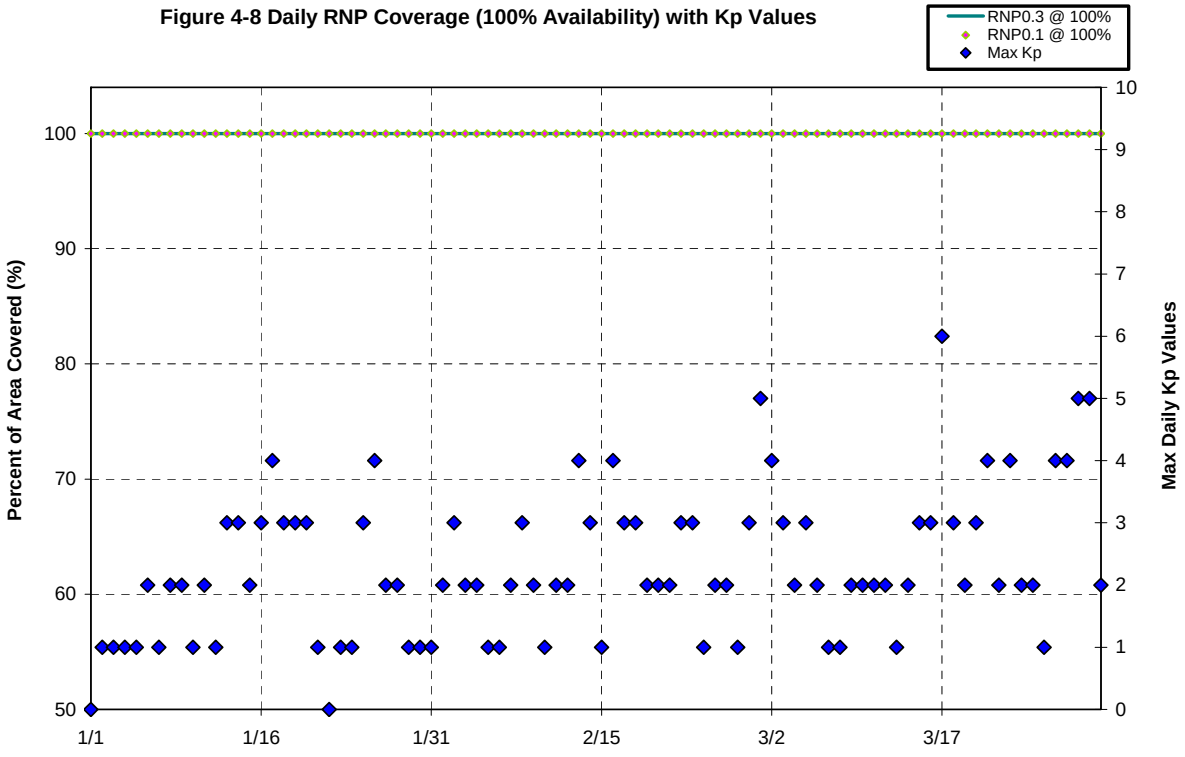


Figure 4-9 Daily RNP Coverage



5.0 INTEGRITY

5.1 HMI Analysis

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

Table 5-1 lists the safety index and the number of HMI events. For this evaluation period, the lowest safety margin index is 2.49 at Fairbanks. There was no HMI event. Since WAAS was made available to the public in August 2000 there has not been an HMI event. WAAS was commissioned by the FAA for safety of life services in July 2003.

Table 5-1 Safety Margin Index and HMI Statistics

Location	Safety Index		
	Horizontal	Vertical	Number of HMIs
Arcata	4.07	10.41	0
Atlantic City	4.39	4.67	0
Grand Forks	4.75	5.51	0
Oklahoma City	4.49	6.28	0
Albuquerque	5.41	8.63	0
Anchorage	8.18	3.88	0
Atlanta	5.48	5.79	0
Barrow	6.49	3.89	0
Bethel	4.21	4.58	0
Billings	5.61	7.98	0
Boston	5.94	4.88	0
Chicago	5.29	6.58	0
Cleveland	6.11	5.83	0
Cold Bay	15.95	10.32	0
Dallas	3.72	5.65	0
Denver	6.27	8.84	0
Fairbanks	7.34	2.49	0
Gander	8.55	10.18	0
Goose Bay	10.02	10.00	0
Houston	3.42	4.69	0
Iqaluit	9.92	4.66	0
Jacksonville	5.96	6.24	0
Juneau	7.33	6.52	0
Kansas City	4.94	7.86	0
Kotzebue	8.65	7.08	0
Los Angeles	5.93	6.91	0
Memphis	5.24	7.30	0
Merida	9.31	6.69	0
Mexico City	6.90	7.04	0
Miami	7.50	6.00	0
Minneapolis	6.43	6.35	0
New York	5.59	5.35	0
Oakland	6.27	10.85	0
Puerto Vallarta	18.11	11.95	0
Salt Lake City	10.18	9.11	0
San Jose Del Cabo	7.17	5.98	0
Seattle	5.87	9.39	0
Washington DC	6.27	5.73	0
Winnipeg	4.28	4.68	0

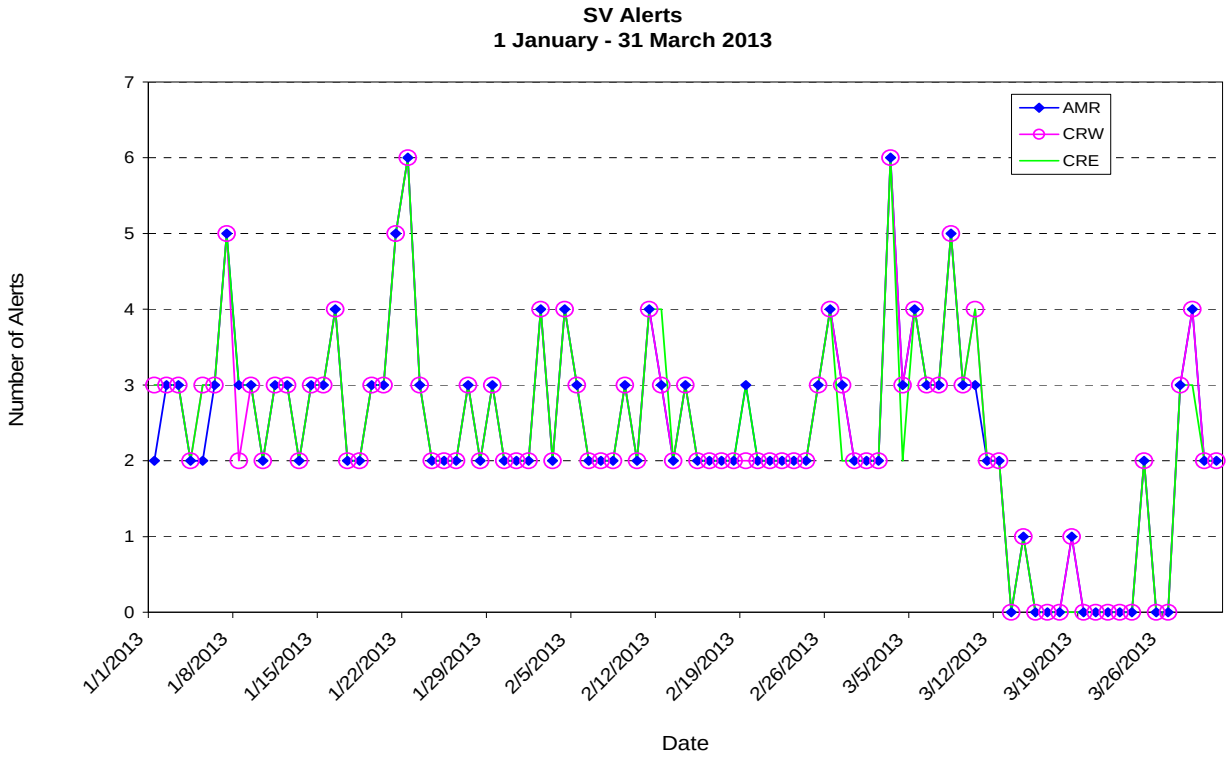
5.2 Broadcast Alerts

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

Table 5-2 WAAS SV Alert

	Number of Alerts			Average Alerts Per Day		
Message Type	**AMR**	**CRW**	**CRE**	**AMR**	**CRW**	**CRE**
2	21	21	22	0.2333	0.2333	0.2444
3	14	14	14	0.1556	0.1556	0.1556
4	180	181	179	2.0000	2.0111	1.9889
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	215	216	215	2.3889	2.4000	2.3889
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	100632	1	157
2	1295945	58	24
3	1295920	62	24
4	1296463	28	24
7	93998	8	138
9	91100	0	0
10	94069	9	126
17	30615	2	384

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

SV	On Time	Late	Max Late Length (seconds)
1	48451	1	179
2	46356	0	0
3	47751	0	0
4	46652	0	0
5	46681	0	0
6	49062	0	0
7	46365	0	0
8	46469	0	0
9	46867	1	170
10	47740	0	0
11	49138	1	167
12	46845	0	0
13	46169	0	0
14	46388	0	0
15	47636	0	0
16	47118	2	187
17	45968	0	0
18	45849	0	0
19	47978	1	175
20	47736	0	0
21	46446	0	0
22	46460	0	0
23	46485	0	0
24	48407	1	170
25	48291	1	167
26	47290	0	0
28	46977	0	0
29	46402	0	0
30	44776	0	0
31	47275	0	0
32	46583	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	39792	1	136
2	38049	1	123
3	39193	1	151
4	38292	0	0
5	38335	0	0
6	40316	1	162
7	38058	0	0
8	38146	1	212
9	38483	1	132
10	39210	0	0
11	40367	1	173
12	38442	0	0
13	37884	0	0
14	38067	1	123
15	39090	1	208
16	38672	0	0
17	37736	2	162
18	37651	0	0
19	39400	1	208
20	39208	1	128
21	38111	1	205
22	38155	7	158
23	38146	1	139
24	39774	4	209
25	39610	1	144
26	38813	2	160
28	38578	3	160
29	38103	0	0
30	36727	0	0
31	38750	0	0
32	38189	1	212
133	74654	1	4314
135	74627	4	4305
138	74592	3	4138

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	26969	8	384
0	1	26973	8	396
0	2	26979	9	396
1	0	26971	9	390
1	1	26972	4	400
1	2	26982	6	392
1	3	26971	5	396
1	4	26980	7	577
2	0	26971	4	383
2	1	26965	6	582
2	2	26981	5	492
2	3	26967	7	504
2	4	26973	9	515
3	0	26974	5	504
3	1	26970	4	582
3	2	26966	9	506
9	0	26966	6	306
9	1	26976	5	310
9	2	26972	4	360
9	3	26960	8	376
9	4	26981	7	373
9	5	26989	7	386
9	6	26962	6	384

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

Band	On Time	Late	Max Late Length (seconds)
0	34772	2	467
1	34777	2	407
2	34784	0	0
3	34735	0	0
9	34794	2	336

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

Message Type	On Time	Late	Max Late Length (seconds)
1	99874	0	0
2	1295960	54	12
3	1295925	64	12
4	1296477	28	10
7	93335	9	132
9	91105	0	0
10	93398	6	125
17	30575	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	48463	0	0
2	46362	0	0
3	47755	0	0
4	46645	0	0
5	46684	0	0
6	49063	0	0
7	46370	0	0
8	46461	0	0
9	46869	0	0
10	47740	0	0
11	49135	0	0
12	46842	0	0
13	46174	0	0
14	46391	0	0
15	47628	0	0
16	47125	0	0
17	45974	0	0
18	45851	0	0
19	47973	0	0
20	47738	0	0
21	46450	0	0
22	46449	0	0
23	46497	0	0
24	48407	0	0
25	48283	0	0
26	47288	0	0
28	46978	0	0
29	46407	0	0
30	44776	0	0
31	47293	0	0
32	46582	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	39816	2	183
2	38054	1	176
3	39191	0	0
4	38286	0	0
5	38326	0	0
6	40328	1	144
7	38057	0	0
8	38157	0	0
9	38483	0	0
10	39195	3	205
11	40378	0	0
12	38448	0	0
13	37890	0	0
14	38071	1	176
15	39089	2	205
16	38661	0	0
17	37741	2	144
18	37645	0	0
19	39392	0	0
20	39252	2	150
21	38093	1	211
22	38163	5	178
23	38139	0	0
24	39782	2	161
25	39612	2	253
26	38830	1	186
28	38584	1	156
29	38103	0	0
30	36730	0	0
31	38753	0	0
32	38191	0	0
133	74646	0	0
135	74616	1	4301
138	74598	3	4320

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	26974	6	393
0	1	26984	4	417
0	2	26974	6	412
1	0	26975	6	415
1	1	26970	7	428
1	2	26986	7	431
1	3	26976	5	440
1	4	26973	4	418
2	0	26977	5	306
2	1	26979	2	304
2	2	26981	4	305
2	3	26984	5	305
2	4	26976	5	306
3	0	26975	6	305
3	1	26989	4	306
3	2	26977	4	307
9	0	26993	4	304
9	1	26974	3	302
9	2	26981	3	412
9	3	26980	4	416
9	4	26980	4	400
9	5	26994	6	400
9	6	26976	4	410

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

Band	On Time	Late	Max Late Length (seconds)
0	34681	0	0
1	34659	1	417
2	34704	0	0
3	34658	0	0
9	34676	0	0

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

Message Type	On Time	Late	Max Late Length (seconds)
1	104839	0	0
2	1295955	57	16
3	1295924	63	16
4	1296461	31	21
7	97873	13	174
9	91105	0	0
10	97926	5	138
17	31002	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	48457	0	0
2	46361	0	0
3	47756	0	0
4	46649	1	166
5	46680	0	0
6	49064	0	0
7	46371	0	0
8	46461	0	0
9	46869	1	160
10	47749	0	0
11	49134	0	0
12	46846	0	0
13	46176	1	151
14	46393	1	154
15	47627	1	154
16	47126	0	0
17	45973	0	0
18	45850	0	0
19	47977	1	166
20	47743	0	0
21	46449	0	0
22	46449	0	0
23	46485	0	0
24	48409	1	160
25	48290	0	0
26	47282	0	0
28	46992	0	0
29	46410	1	182
30	44782	0	0
31	47288	0	0
32	46587	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	39820	0	0
2	38061	0	0
3	39193	0	0
4	38287	0	0
5	38324	0	0
6	40338	0	0
7	38052	2	212
8	38159	0	0
9	38481	1	208
10	39199	0	0
11	40378	0	0
12	38448	0	0
13	37891	0	0
14	38076	0	0
15	39089	1	208
16	38665	0	0
17	37737	1	128
18	37644	0	0
19	39394	0	0
20	39259	0	0
21	38098	0	0
22	38168	0	0
23	38141	1	139
24	39779	2	161
25	39616	2	128
26	38834	0	0
28	38579	1	139
29	38101	0	0
30	36731	0	0
31	38756	0	0
32	38189	2	212
133	74654	0	0
135	74629	2	170
138	74601	2	4236

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	26991	3	367
0	1	26983	3	363
0	2	26992	7	394
1	0	26968	7	392
1	1	26967	8	369
1	2	26978	5	387
1	3	26960	7	387
1	4	26991	5	306
2	0	26976	4	302
2	1	26984	7	353
2	2	26969	6	363
2	3	26982	9	368
2	4	26994	9	362
3	0	26958	9	357
3	1	26965	10	364
3	2	26975	7	386
9	0	26965	9	380
9	1	26984	6	352
9	2	26972	6	363
9	3	26967	10	581
9	4	26969	8	584
9	5	26970	7	574
9	6	26970	5	322

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

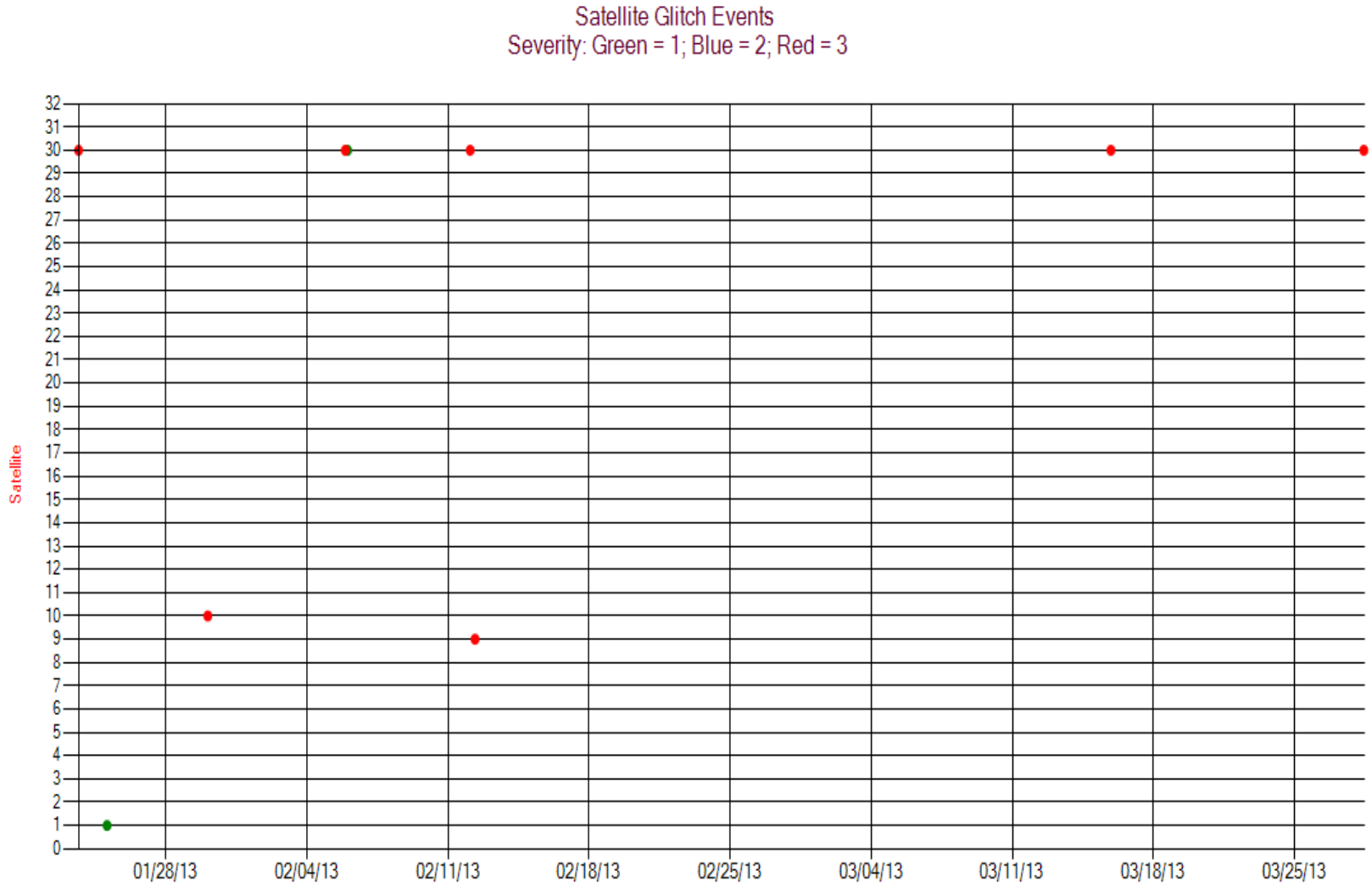
Band	On Time	Late	Max Late Length (seconds)
0	35270	0	0
1	35270	2	450
2	35301	2	453
3	35326	1	325
9	35261	1	316

5.4 Satellite Glitches

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

Figure 5-2 shows the satellite glitches visible to WAAS for the quarter. Glitches are categorized into three severity levels. Severity one glitches cause a significant number of the receivers to simultaneously have bad subframe parity, but not all receivers. Severity two glitches cause all of the receivers to report bad subframe parity data and some receivers to also have cycle slips and or lose tracking of L2 and or L1. Severity three glitches cause all of the receivers to lose track of both L1 and L2 data.

Figure 5-2 SV Glitch Trend



6.0 SV RANGE ACCURACY

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

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

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

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

For this reporting period, most satellites range errors were bounded 99.9% of the time by UDRE .The unbounded range errors on PRN 22 at Houston and PRN-25 at Albuquerque were due to geomagnetic activity. All other unbounded errors were due to noise and multipath.

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

Site →	Billings		Albuquerque		Boston		Washington DC		Houston		Kansas City	
SV ↓	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)
1	2.365	100	2.414	100	2.646	100	1.839	100	1.889	100	2.236	100
2	1.605	100	1.741	100	1.632	100	1.762	100	2.627	99.984	2.077	100
3	1.127	100	0.913	100	1.186	100	1.209	100	1.155	100	0.922	100
4	1.629	100	1.275	100	1.625	100	1.226	100	1.576	100	2.269	100
5	1.540	100	1.753	100	1.558	100	1.162	100	1.163	100	1.768	100
6	1.849	100	1.409	100	1.391	100	0.966	100	0.904	100	0.965	100
7	1.290	100	0.963	100	1.554	100	0.886	100	1.145	100	0.970	100
8	0.912	100	0.805	100	1.371	100	1.177	100	1.429	100	1.367	100
9	1.219	100	1.063	100	1.156	100	0.977	100	1.773	100	1.211	100
10	1.455	100	1.090	100	1.189	100	1.301	100	2.089	100	1.151	100
11	1.040	100	1.004	100	0.840	100	1.284	100	2.342	100	1.000	100
12	1.313	100	1.251	100	1.261	100	1.097	100	1.395	100	1.310	100
13	1.201	100	1.255	100	1.251	100	1.115	100	1.388	100	1.051	100
14	1.278	100	0.792	100	1.264	100	1.478	100	1.983	100	0.946	100
15	1.316	100	1.438	100	1.488	100	1.186	100	1.239	100	1.471	100
16	1.102	100	1.224	100	1.624	100	1.577	100	1.695	100	1.691	100
17	1.437	100	1.097	100	1.228	100	0.839	100	1.906	100	1.015	100
18	1.140	100	1.089	100	1.476	100	1.856	100	1.791	100	1.323	100
19	2.336	100	2.167	100	2.722	100	3.001	100	3.229	100	2.674	100
20	0.956	100	1.495	100	1.110	100	1.899	100	1.925	100	1.565	100
21	1.177	100	1.245	100	1.399	100	1.773	100	1.815	100	1.663	100
22	2.358	100	1.961	100	2.691	100	2.958	100	2.843	99.999	2.189	100
23	1.347	100	1.696	100	2.370	100	2.182	100	3.021	100	1.712	100
24	2.778	100	2.724	100	2.955	100	2.442	100	2.972	100	2.630	100
25	2.883	100	2.504	99.994	2.290	100	2.010	100	2.399	100	2.382	100
26	1.523	100	1.444	100	1.605	100	1.097	100	1.140	100	1.339	100
27	-	-	-	-	-	-	-	-	-	-	-	-
28	0.818	100	1.016	100	0.954	100	1.404	100	2.155	100	1.170	100
29	1.860	100	1.992	100	1.232	100	1.317	100	1.041	100	1.294	100
30	0.957	100	1.005	100	1.064	100	1.370	100	1.602	100	1.144	100
31	2.154	100	1.092	100	0.891	100	0.883	100	1.235	100	1.204	100
32	1.212	100	0.840	100	1.147	100	1.081	100	1.907	100	1.109	100
135	2.071	100	2.541	100	2.476	100	2.125	100	2.098	100	1.653	100
138	1.246	100	1.219	100	1.564	100	1.550	100	1.692	100	1.807	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	2.345	100	2.649	100	1.761	100	2.389	100	1.837	100	2.382	100
2	1.619	100	1.410	100	2.327	100	1.351	100	1.865	100	1.269	100
3	2.108	100	0.998	100	1.036	100	1.095	100	0.788	100	1.163	100
4	1.419	100	1.517	100	1.578	100	1.327	100	1.225	100	1.474	100
5	1.503	100	1.579	100	1.159	100	1.527	100	1.219	100	1.676	100
6	1.220	100	1.415	100	1.175	100	1.673	100	0.998	100	1.425	100
7	1.173	100	1.390	100	1.623	100	1.125	100	0.756	100	1.505	100
8	1.019	100	0.995	100	0.983	100	1.305	100	0.907	100	1.207	100
9	1.143	100	1.296	100	1.213	100	1.149	100	1.127	100	1.384	100
10	1.185	100	0.841	100	1.753	100	0.924	100	1.555	100	1.001	100
11	1.143	100	1.079	100	2.792	100	0.918	100	1.600	100	0.878	100
12	1.120	100	1.178	100	1.264	100	1.023	100	1.021	100	1.342	100
13	0.923	100	2.049	100	1.077	100	1.203	100	0.925	100	1.210	100
14	0.908	100	0.976	100	1.716	100	0.899	100	1.277	100	0.893	100
15	1.940	100	1.290	100	1.018	100	1.647	100	0.931	100	1.656	100
16	1.606	100	1.134	100	1.808	100	1.383	100	1.736	100	0.928	100
17	1.002	100	1.132	100	1.342	100	0.932	100	1.088	100	1.064	100
18	1.258	100	1.207	100	2.306	100	1.207	100	1.864	100	1.107	100
19	2.153	100	2.085	100	2.918	100	1.932	100	3.165	100	2.093	100
20	1.187	100	1.436	100	2.090	100	1.333	100	1.778	100	1.243	100
21	1.135	100	1.005	100	2.433	100	0.912	100	1.599	100	1.124	100
22	2.070	100	1.971	100	3.303	99.983	2.324	100	2.887	99.997	2.387	100
23	1.709	100	1.617	100	2.428	100	1.461	100	2.265	100	1.719	100
24	2.630	100	3.854	99.808	2.105	100	2.397	100	2.334	100	2.947	100
25	2.339	100	2.383	100	1.981	100	2.350	100	1.847	100	2.612	100
26	1.699	100	1.617	100	0.910	100	1.758	100	1.008	100	1.672	100
27	-	-	-	-	-	-	-	-	-	-	-	-
28	0.987	100	1.289	100	2.256	100	0.889	100	1.593	100	0.933	100
29	1.204	100	1.898	100	1.458	100	1.386	100	1.094	100	1.669	100
30	1.365	100	0.853	100	1.831	100	0.880	100	1.527	100	0.897	100
31	1.257	100	1.385	100	2.649	100	0.786	100	1.153	100	1.354	100
32	0.833	100	1.188	100	1.442	100	1.167	100	1.302	100	0.895	100
135	1.757	100	1.710	100	1.620	100	2.059	100	2.165	100	1.743	100
138	2.310	100	1.721	100	2.344	100	1.614	100	1.244	100	1.552	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	1.473	100	1.593	100	1.735	100	1.276	100	1.277	100	1.352	100
2	1.196	100	0.883	100	1.006	100	1.150	100	1.451	100	1.214	100
3	0.403	100	0.658	100	0.650	100	0.594	100	0.807	100	0.372	100
4	0.993	100	1.151	100	1.193	100	0.974	100	1.303	100	1.604	100
5	1.054	100	1.077	100	1.009	100	0.659	100	0.927	100	1.120	100
6	0.718	100	0.744	100	0.861	100	0.455	100	0.525	100	0.504	100
7	0.871	100	0.809	100	0.950	100	0.721	100	0.735	100	0.688	100
8	0.518	100	0.662	100	0.803	100	0.610	100	0.571	100	0.795	100
9	0.552	100	0.630	100	0.579	100	0.465	100	0.543	100	0.579	100
10	0.543	100	0.433	100	0.395	100	0.492	100	1.101	100	0.495	100
11	0.625	100	0.456	100	0.423	100	0.550	100	1.135	100	0.444	100
12	0.603	100	0.754	100	0.728	100	0.463	100	0.679	100	0.563	100
13	0.588	100	0.833	100	0.758	100	0.586	100	0.722	100	0.575	100
14	0.725	100	0.441	100	0.644	100	0.485	100	0.878	100	0.517	100
15	0.625	100	0.910	100	0.827	100	0.904	100	0.871	100	0.916	100
16	0.640	100	0.531	100	0.591	100	0.723	100	0.857	100	0.549	100
17	0.939	100	0.949	100	0.826	100	0.504	100	0.980	100	0.642	100
18	0.925	100	0.642	100	0.749	100	1.018	100	1.064	100	0.702	100
19	1.582	100	1.428	100	1.506	100	1.699	100	2.226	100	1.658	100
20	0.648	100	0.767	100	0.580	100	0.790	100	0.918	100	0.767	100
21	0.969	100	0.746	100	0.991	100	1.128	100	1.200	100	0.988	100
22	1.967	100	1.457	100	1.754	100	2.007	100	2.116	100	1.695	100
23	1.110	100	1.217	100	1.408	100	1.449	100	2.125	100	1.155	100
24	1.807	100	1.917	100	1.855	100	1.554	100	1.686	100	1.574	100
25	1.529	100	1.670	100	1.442	100	1.226	100	1.270	100	1.393	100
26	0.840	100	0.982	100	0.889	100	0.664	100	0.652	100	0.741	100
27	-	-	-	-	-	-	-	-	-	-	-	-
28	0.518	100	0.360	100	0.430	100	0.658	100	0.710	100	0.568	100
29	0.842	100	1.156	100	0.803	100	0.663	100	0.686	100	0.737	100
30	0.633	100	0.674	100	0.397	100	0.444	100	0.646	100	0.585	100
31	1.364	100	0.671	100	0.440	100	0.472	100	0.801	100	0.619	100
32	0.546	100	0.541	100	0.424	100	0.380	100	0.684	100	0.388	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	1.516	100	1.559	100	1.364	100	1.589	100	1.273	100	1.459	100
2	0.939	100	0.930	100	1.292	100	0.987	100	1.274	100	0.954	100
3	0.847	100	0.404	100	0.529	100	0.648	100	0.385	100	0.550	100
4	0.998	100	1.087	100	1.301	100	0.971	100	0.673	100	0.929	100
5	1.030	100	0.960	100	0.841	100	0.874	100	0.552	100	0.934	100
6	0.636	100	0.601	100	0.383	100	0.716	100	0.432	100	0.704	100
7	0.893	100	0.799	100	0.826	100	0.794	100	0.466	100	0.818	100
8	0.703	100	0.594	100	0.729	100	0.792	100	0.410	100	0.618	100
9	0.749	100	0.671	100	0.515	100	0.598	100	0.548	100	0.687	100
10	0.578	100	0.398	100	0.631	100	0.453	100	0.772	100	0.364	100
11	0.467	100	0.435	100	1.115	100	0.508	100	0.877	100	0.436	100
12	0.712	100	0.735	100	0.655	100	0.617	100	0.590	100	0.728	100
13	0.696	100	0.944	100	0.651	100	0.629	100	0.527	100	0.640	100
14	0.496	100	0.483	100	0.645	100	0.461	100	0.619	100	0.440	100
15	1.023	100	0.702	100	0.765	100	0.924	100	0.508	100	0.921	100
16	0.656	100	0.428	100	0.697	100	0.633	100	0.889	100	0.503	100
17	0.781	100	0.672	100	0.669	100	0.659	100	0.406	100	0.519	100
18	0.689	100	0.860	100	1.107	100	0.870	100	1.325	100	0.845	100
19	1.305	100	1.484	100	1.525	100	1.454	100	2.008	100	1.379	100
20	0.470	100	0.706	100	1.205	100	0.761	100	0.999	100	0.597	100
21	0.668	100	0.714	100	1.484	100	0.805	100	1.150	100	0.793	100
22	1.439	100	1.592	100	2.138	100	1.798	100	2.167	100	1.722	100
23	1.143	100	1.129	100	1.690	100	1.062	100	1.677	100	1.169	100
24	1.896	100	2.286	100	1.609	100	1.714	100	1.506	100	2.038	100
25	1.700	100	1.633	100	1.369	100	1.514	100	1.099	100	1.631	100
26	0.985	100	0.901	100	0.584	100	1.005	100	0.529	100	0.878	100
27	-	-	-	-	-	-	-	-	-	-	-	-
28	0.432	100	0.556	100	1.311	100	0.589	100	1.031	100	0.476	100
29	0.792	100	0.977	100	0.861	100	0.718	100	0.606	100	0.801	100
30	0.710	100	0.451	100	0.555	100	0.439	100	0.640	100	0.485	100
31	0.693	100	0.666	100	0.923	100	0.451	100	0.443	100	0.637	100
32	0.482	100	0.694	100	0.588	100	0.414	100	0.650	100	0.503	100

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

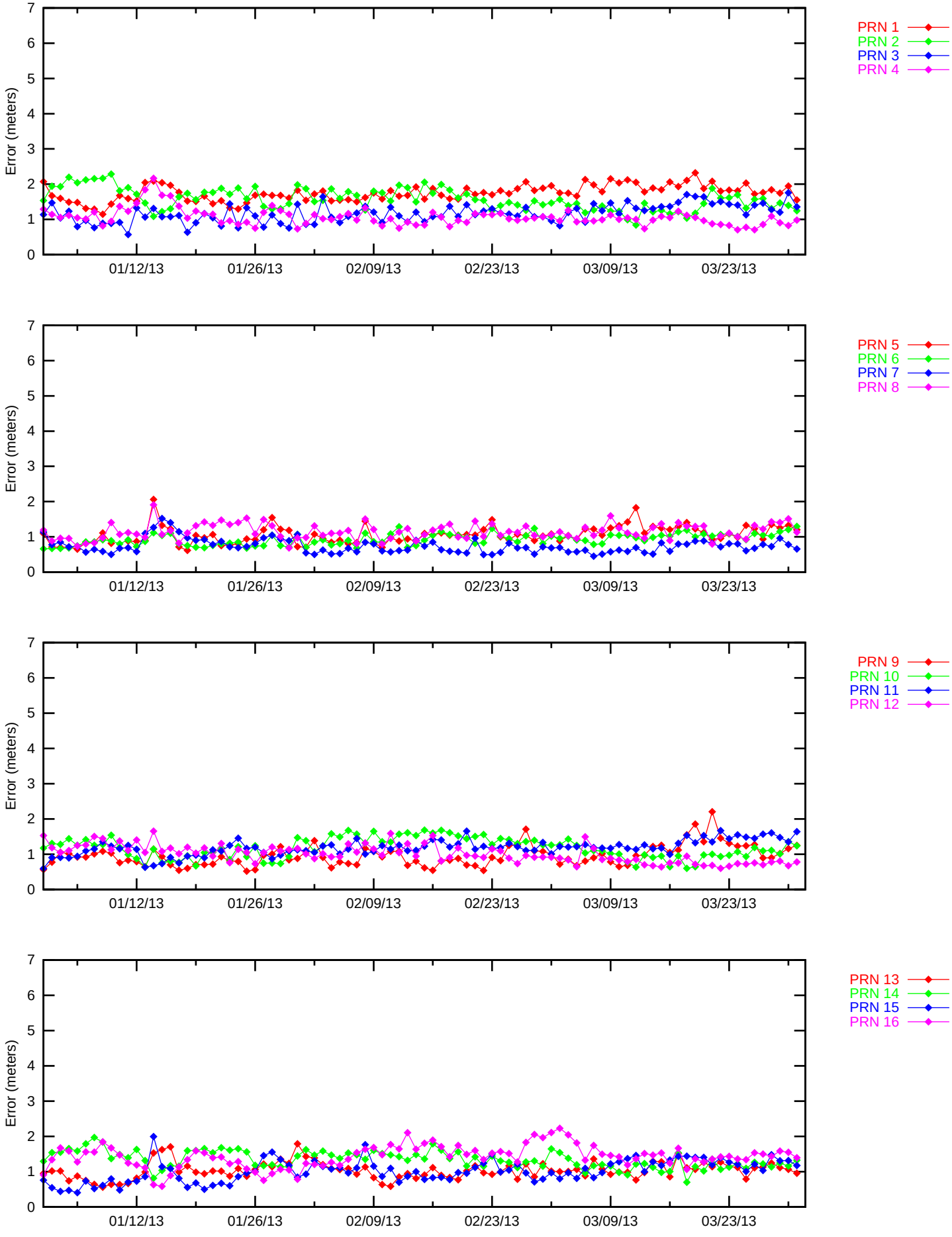


Figure 6-2 95% Range Error (PRN 17 - PRN 32) - Washington DC

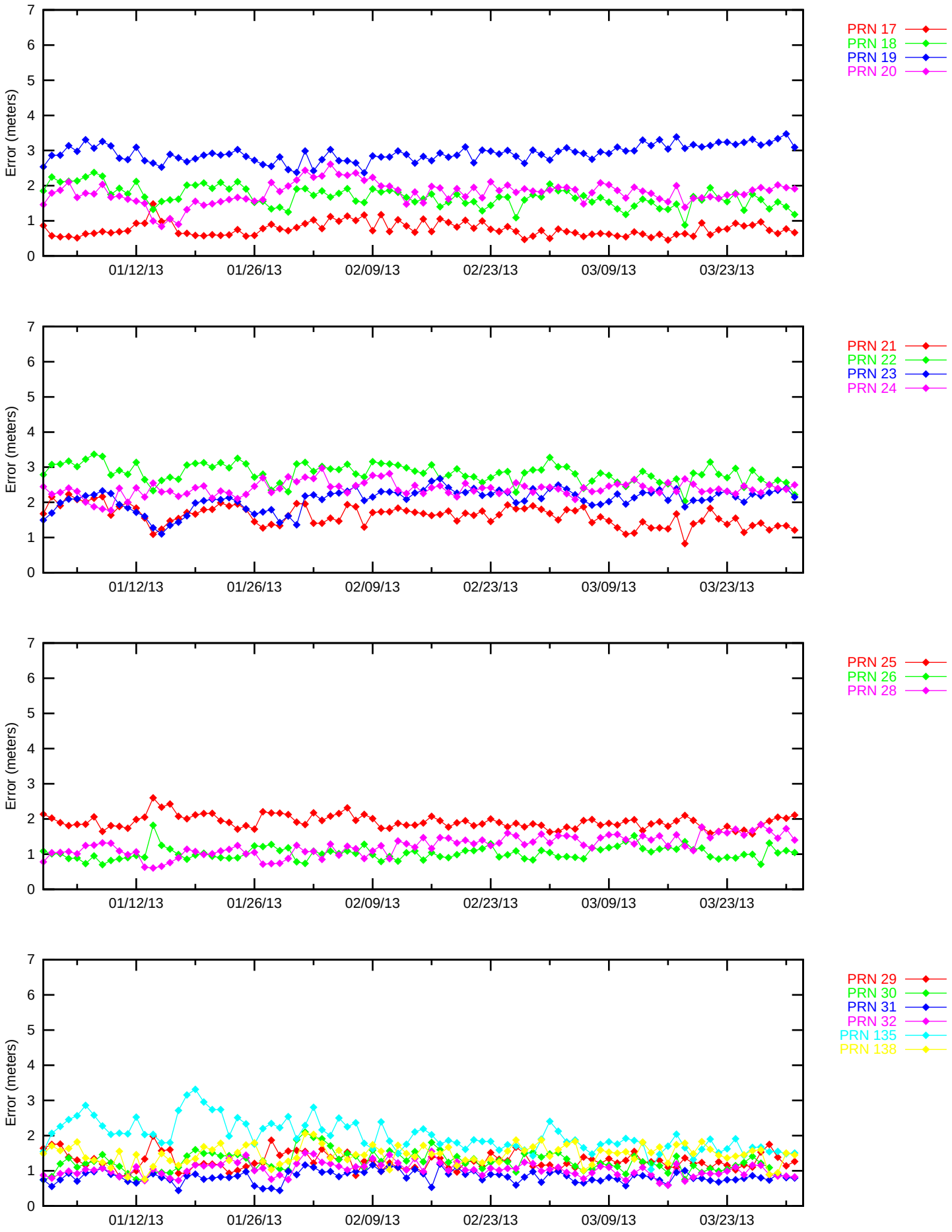


Figure 6-3 95% Ionospheric (PRN 1 - PRN 16) - Washington DC

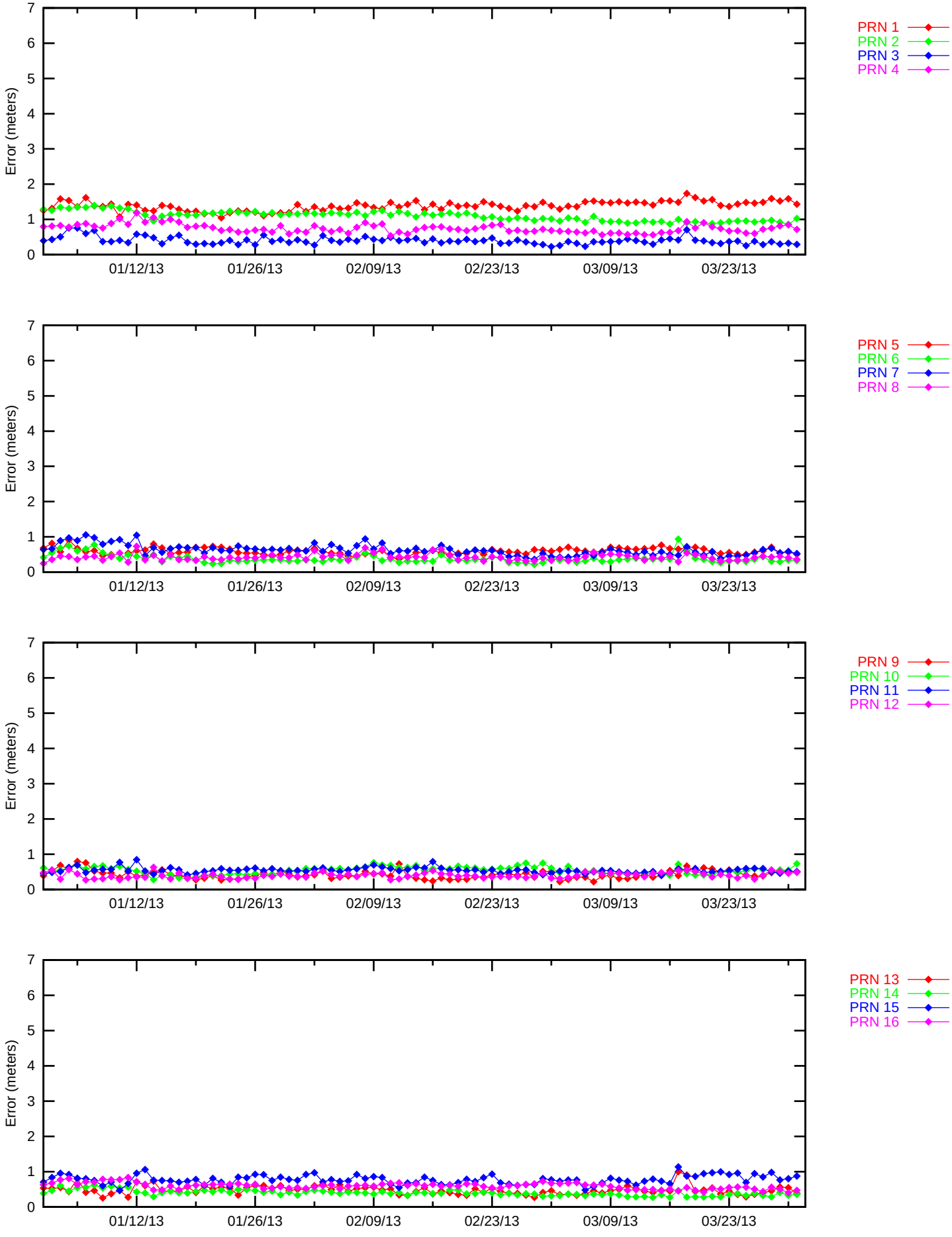
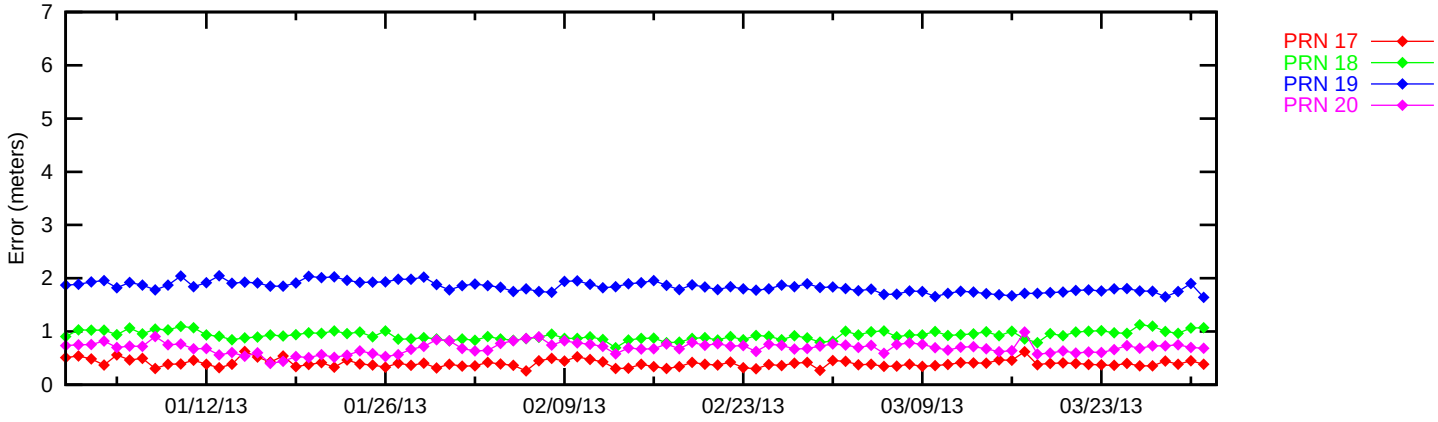
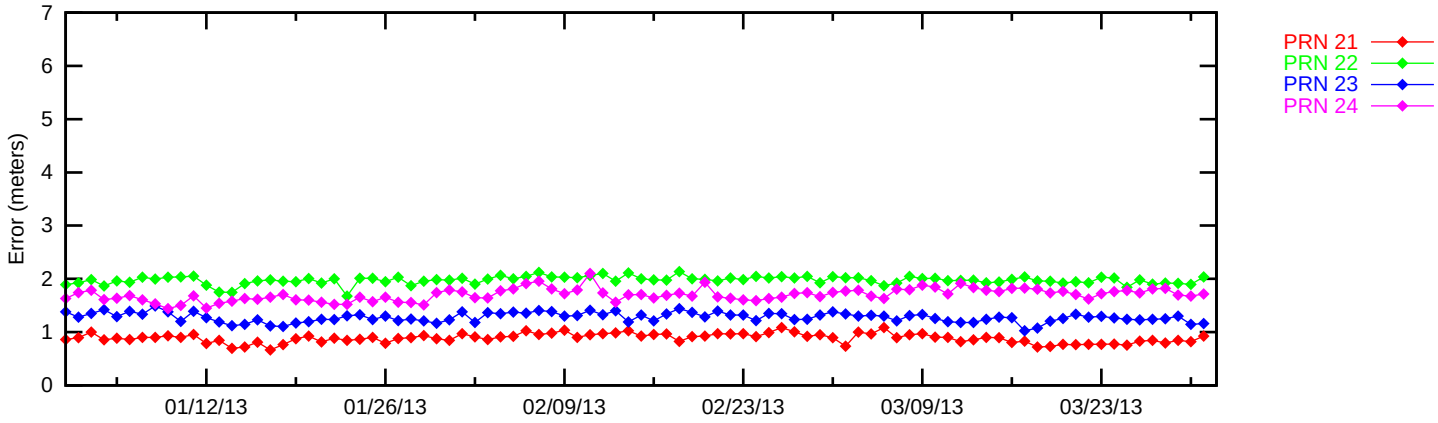
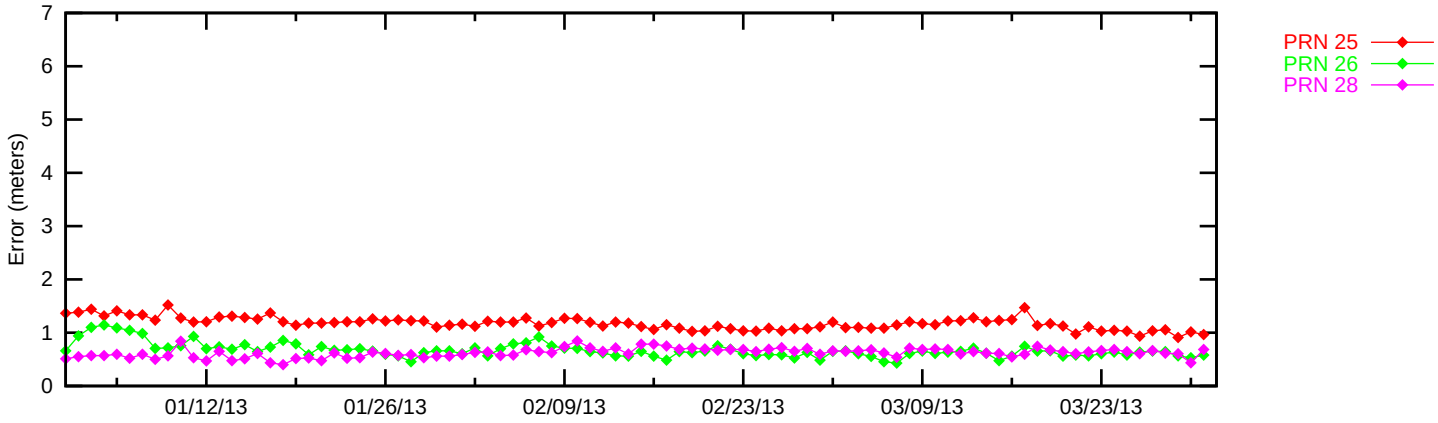
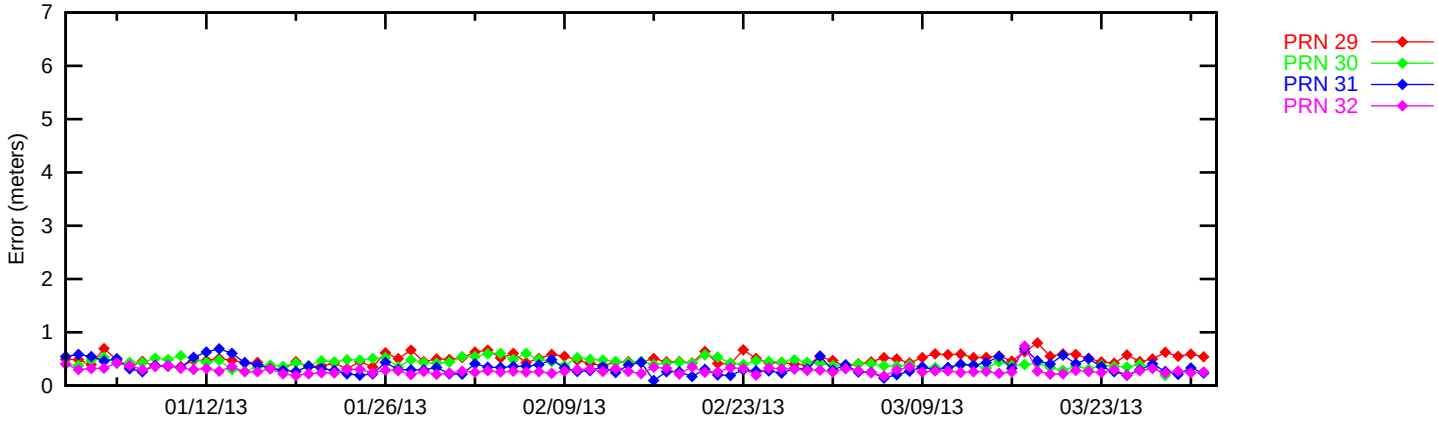


Figure 6-4 95% Ionospheric (PRN 17 - PRN 32) - Washington DC









7.0 GEO RANGING PERFORMANCE

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

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

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
AMR 133	CRW	99.17	0.47	0.11	0.24
AMR 133	CRE	98.82	0.90	0.16	0.11
AMR 133	AMR	0	99.83	0.16	0
CRW 135	CRW	99.17	0.47	0.11	0.24
CRW 135	CRE	98.82	0.90	0.16	0.11
CRW 135	AMR	0	99.83	0.16	0
CRE 138	CRW	99.19	0.47	0.11	0.21
CRE 138	CRE	98.82	0.90	0.16	0.11
CRE 138	AMR	0	99.83	0.16	0

Figure 7-1 Daily PA CRW GEO Ranging Availability Trend

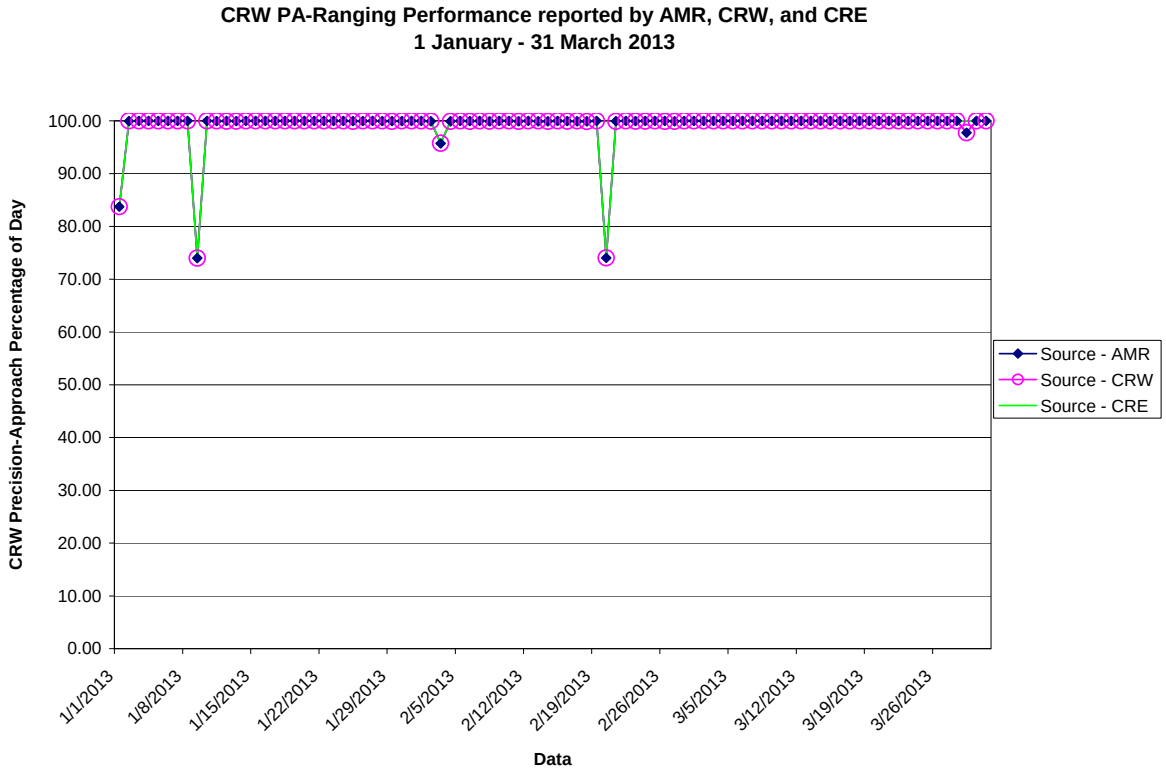


Figure 7-2 Daily PA CRE GEO Ranging Availability Trend

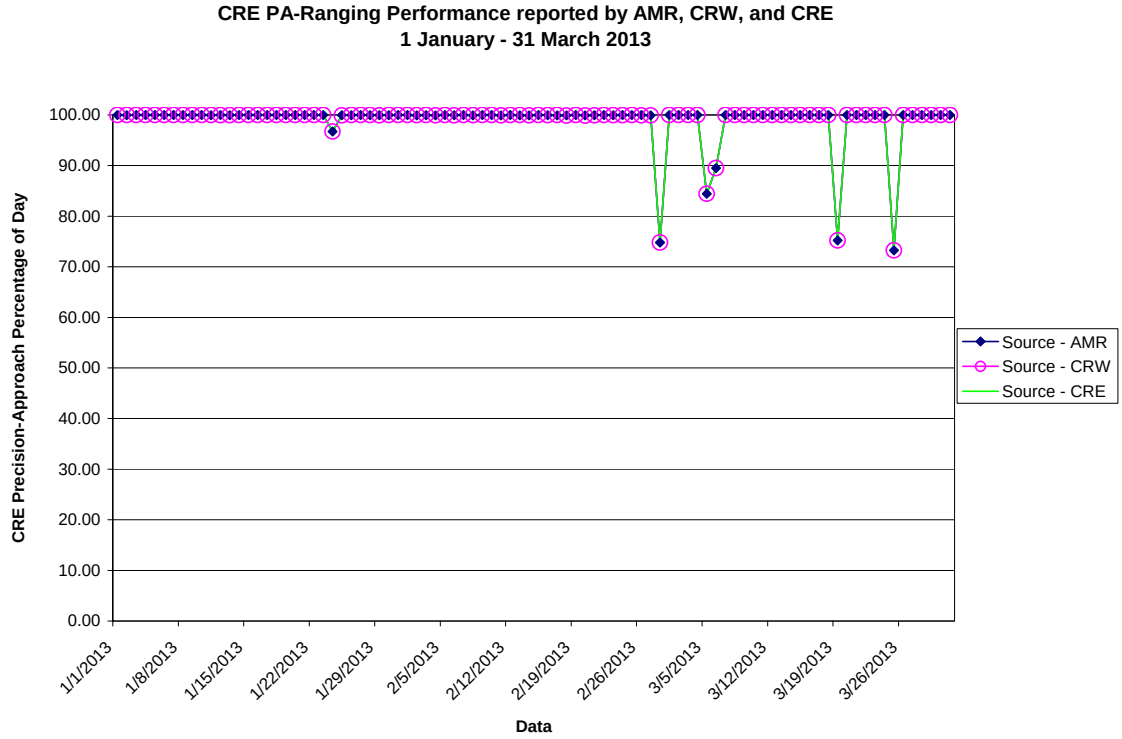
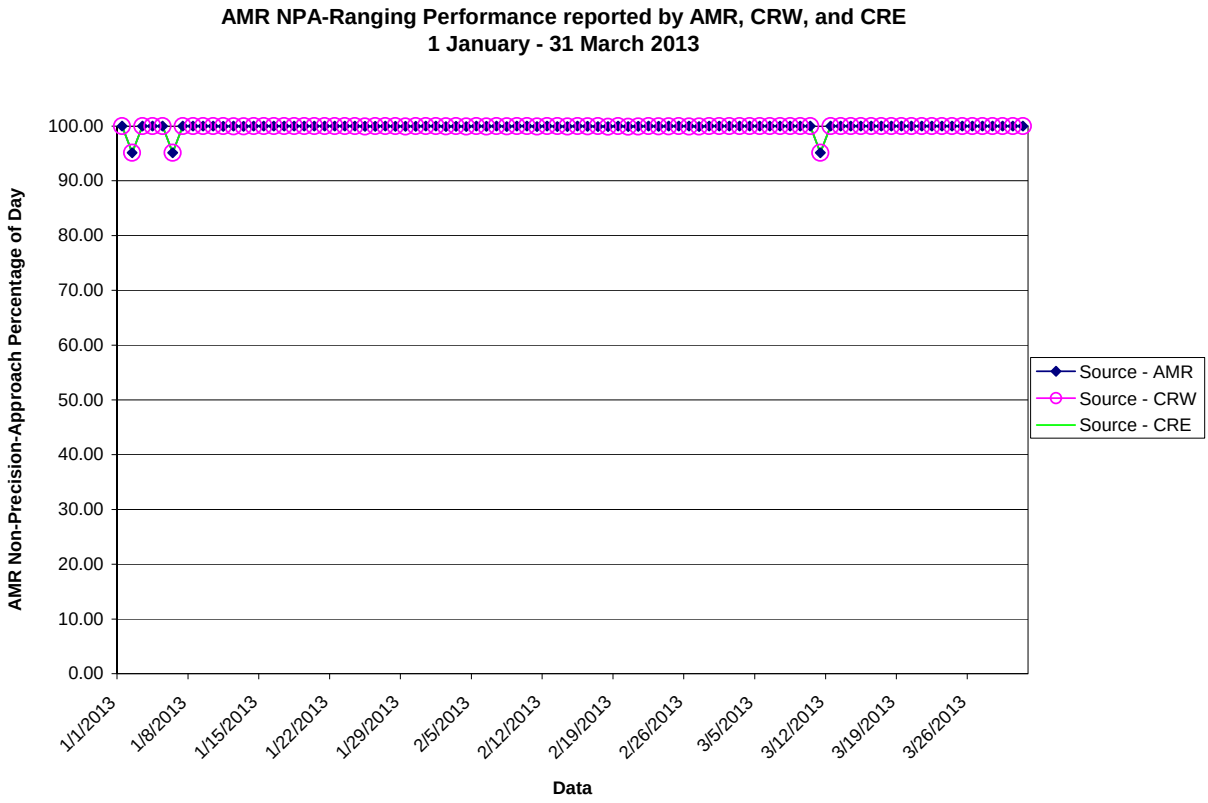


Figure 7-3 Daily NPA AMR GEO Ranging Availability Trend



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	0	1	0	1	0	1
CEV3	VEGREVILLE	AB	LPV	0	1	0	1	0	1
CYEG	EDMONTON / JOSEPHBURG	AB	LPV	0	1	0	1	0	1
CYXD	EDMONTON CITY CTR	AB	LPV	0	1	0	1	0	1
2C7	SHAKTOOLIK	AK	LPV	0	1	0	1	2	0.999965
6A8	ALLAKAKET	AK	LP	0	1	0	1	1	0.999988
7KA	TATITLEK	AK	LP	0	1	0	1	0	1
9A3	CHUATHBALUK	AK	LPV	0	1	0	1	1	0.999996
AKN	KING SALMON	AK	LPV	0	1	0	1	1	0.999996
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	1	0	1	0	1
AQH	QUINHAGAK	AK	LPV	0	1	0	1	11	0.999464
AQT	NUIQSUT	AK	LPV	0	1	0	1	5	0.999545
BET	BETHEL	AK	LPV200	0	1	0	1	4	0.999819
BRW	WILEY POST-WILL ROGERS MEM	AK	LPV	0	1	4	0.999823	101	0.992840
CDB	COLD BAY	AK	LPV	0	1	2	0.999927	271	0.968144
CLP	CLARKS POINT	AK	LPV	0	1	0	1	2	0.999884
CXF	COLDFOOT	AK	LP	0	1	0	1	2	0.999961

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	0	1	1	0.999985	25	0.997917
DLG	DILLINGHAM	AK	LPV	0	1	0	1	4	0.999880
ELI	ELIM	AK	LPV	0	1	0	1	3	0.999865
ENA	KENAI MUNICIPAL	AK	LPV200	0	1	0	1	0	1
ENM	EMMONAK	AK	LPV	0	1	0	1	4	0.999664
FAI	FAIRBANKS INTL	AK	LPV200	0	1	0	1	0	1
GAL	EDWARD G. PITKA	AK	LPV	0	1	0	1	0	1
GKN	GULKANA	AK	LPV	0	1	0	1	0	1
HLA	HUSLIA	AK	LPV	0	1	0	1	1	0.999996
HOM	HOMER	AK	LPV	0	1	0	1	0	1
HPB	HOOPER BAY	AK	LP	0	1	0	1	14	0.998684
ILI	ILIAMNA	AK	LPV	0	1	0	1	0	1
KAL	KALTAG	AK	LPV	0	1	0	1	1	0.999996
KSM	ST MARY'S	AK	LPV200	0	1	0	1	4	0.999703
KTN	KETCHIKAN INTL	AK	LPV	0	1	0	1	0	1
KWT	KWETHLUK	AK	LPV	0	1	0	1	3	0.999838
KYU	KOYUKUK	AK	LPV	0	1	0	1	0	1
MCG	MCGRATH	AK	LP	0	1	0	1	0	1
MDM	MARSHALL DON HUNTER SR	AK	LP	0	1	0	1	4	0.999873
MDO	MIDDLETON ISLAND	AK	LP	0	1	0	1	0	1
OOK	TOKSOOK BAY	AK	LP	0	1	0	1	26	0.998322
ORT	NORTHWAY	AK	LP	0	1	0	1	1	0.999996
OTZ	RALPH WIEN MEMORIAL	AK	LPV200	0	1	2	0.999981	30	0.997485
PAQ	PALMER MUNICIPAL	AK	LP	0	1	0	1	0	1
RBY	RUBY	AK	LPV	0	1	0	1	0	1
SCC	DEADHORSE	AK	LPV	0	1	0	1	4	0.999718
SCM	SCAMMON BAY	AK	LP	0	1	0	1	10	0.999078
SHG	SHUNGNAK	AK	LP	0	1	0	1	3	0.999842
SHX	SHAGELUK	AK	LPV	0	1	0	1	0	1
SMK	ST MICHAEL	AK	LPV	0	1	0	1	3	0.999958
UNK	UNALAKLEET	AK	LP	0	1	0	1	1	0.999977
WLK	SELAWIK	AK	LPV	0	1	0	1	5	0.999676
WNA	NAPAKIAK	AK	LPV	0	1	0	1	6	0.999799
YAK	YAKUTAT	AK	LPV200	0	1	0	1	0	1
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	1	0	1	0	1
0J6	HEADLAND MUNICIPAL	AL	LPV	0	1	0	1	0	1
12J	BREWTON MUNICIPAL	AL	LPV	0	1	0	1	0	1
1M4	POSEY FIELD	AL	LPV	0	1	0	1	0	1
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	1	0	1	0	1
2R5	ST ELMO	AL	LPV	0	1	0	1	0	1
3A1	FOLSOM FIELD	AL	LPV	0	1	0	1	0	1
4A9	ISBELL FIELD	AL	LPV	0	1	0	1	0	1
5R4	FOLEY MUNICIPAL	AL	LPV	0	1	0	1	0	1
79J	SOUTH ALABAMA RGNL AT BILL BENTON FIELD	AL	LPV	0	1	0	1	0	1
8A0	ALBERTVILLE MUNICIPAL-T. J. BRUMLIK FIELD	AL	LPV	0	1	0	1	0	1
ANB	ANNISTON METROPOLITAN	AL	LPV	0	1	0	1	0	1
ASN	TALLADEGA MUNICIPALCIPAL	AL	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
AUO	AUBURN-OPELIKA ROBERT G PITTS	AL	LPV	0	1	0	1	0	1
BFM	MOBILE DOWNTOWN	AL	LPV200	0	1	0	1	0	1
BHM	BIRMINGHAM INTL	AL	LPV200	0	1	0	1	0	1
CQF	H L SONNY CALLAHAN	AL	LPV200	0	1	0	1	0	1
DCU	PRYOR FIELD REGIONAL	AL	LPV200	0	1	0	1	0	1
DHN	DOTHAN REGIONAL	AL	LPV	0	1	0	1	0	1
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	1	0	1	0	1
EET	SHELBY COUNTY	AL	LPV	0	1	0	1	0	1
EKY	BESSEMER	AL	LPV	0	1	0	1	0	1
EUF	WEEDON FIELD	AL	LPV	0	1	0	1	0	1
GAD	NORTHEAST ALABAMA REGIONAL	AL	LPV200	0	1	0	1	0	1
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	1	0	1	0	1
HSV	HUNTSVILLE INTL-CARL T JONES FLD	AL	LPV200	0	1	0	1	0	1
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	1	0	1	0	1
JKA	JACK EDWARDS	AL	LPV200	0	1	0	1	0	1
M95	RICHARD ARTHUR FIELD	AL	LPV	0	1	0	1	0	1
MDQ	MADISON COUNTY EXECUTIVE/TOM SHARP JR FLD	AL	LPV	0	1	0	1	0	1
MGM	MONTGOMERY REGIONAL (DANNELLY FIELD)	AL	LPV200	0	1	0	1	0	1
MOB	MOBILE REGIONAL	AL	LPV	0	1	0	1	0	1
MSL	NORTHWEST ALABAMA REGIONAL	AL	LPV200	0	1	0	1	0	1
PLR	ST CLAIR COUNTY	AL	LPV	0	1	0	1	0	1
PYP	CENTRE-PIEDMONT CHEROKEE COUNTY RGNL	AL	LPV	0	1	0	1	0	1
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	1	0	1	0	1
SEM	CRAIG FIELD	AL	LPV	0	1	0	1	0	1
TCL	TUSCALOOSA REGIONAL	AL	LPV	0	1	0	1	0	1
TOI	TROY MUNICIPAL	AL	LPV	0	1	0	1	0	1
4M3	CARLISLE MUNICIPAL	AR	LPV	0	1	0	1	0	1
7M1	MC GEHEE MUNICIPAL	AR	LP	0	1	0	1	0	1
ARG	WALNUT RIDGE REGIONAL	AR	LPV200	0	1	0	1	0	1
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	1	0	1	0	1
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV200	0	1	0	1	0	1
BPK	OZARK REGIONAL	AR	LPV	0	1	0	1	0	1
BVX	BATESVILLE REGIONAL	AR	LPV	0	1	0	1	0	1
BYH	ARKANSAS INTL	AR	LPV200	0	1	0	1	0	1
CDH	HARRELL FIELD	AR	LPV	0	1	0	1	0	1
ELD	SOUTH ARKANSAS REGIONAL AT GOODWIN FIELD	AR	LPV	0	1	0	1	0	1
FSM	FORT SMITH RGNL	AR	LPV200	0	1	0	1	0	1
HRO	BOONE COUNTY	AR	LPV	0	1	0	1	0	1
JBR	JONESBORO MUNICIPAL	AR	LPV	0	1	0	1	0	1
LIT	ADAMS FIELD	AR	LPV200	0	1	0	1	0	1
M19	NEWPORT MUNICIPAL	AR	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
M77	HOWARD COUNTY	AR	LP	0	1	0	1	0	1
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	1	0	1	0	1
PBF	GRIDER FIELD	AR	LPV	0	1	0	1	0	1
ROG	ROGERS MUNICIPAL-CARTER FIELD	AR	LPV	0	1	0	1	0	1
RUE	RUSSELLVILLE REGIONAL	AR	LPV	0	1	0	1	0	1
SGT	STUTTGART MUNICIPAL	AR	LPV	0	1	0	1	0	1
SLG	SMITH FIELD	AR	LPV	0	1	0	1	0	1
SRC	SEARCY MUNICIPAL	AR	LPV	0	1	0	1	0	1
SUZ	SALINE COUNTY REGIONAL	AR	LPV	0	1	0	1	0	1
TXK	TEXARKANA REGIONAL-WEBB FIELD	AR	LPV	0	1	0	1	0	1
XNA	NORTHWEST ARKANSAS REGIONAL	AR	LPV200	0	1	0	1	0	1
AVQ	MARANA REGIONAL	AZ	LP	0	1	0	1	85	0.997319
D68	SPRINGERVILLE MUNICIPAL	AZ	LP	0	1	0	1	1	0.999977
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	1	0	1	22	0.999672
FFZ	FALCON FLD	AZ	LP	0	1	0	1	35	0.999568
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	1	0	1	89	0.996979
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	1	0	1	1	0.999996
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	1	0	1	57	0.999140
HII	LAKE HAVASU CITY	AZ	LPV	0	1	0	1	0	1
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	1	0	1	0	1
IGM	KINGMAN	AZ	LPV	0	1	0	1	0	1
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	1	0	1	53	0.999232
P33	COCHISE COUNTY	AZ	LPV	0	1	0	1	57	0.999313
PGA	PAGE MUNICIPAL	AZ	LPV	0	1	0	1	0	1
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	1	0	1	55	0.999151
PRC	ERNEST A. LOVE FIELD	AZ	LPV	0	1	0	1	1	0.999988
RQE	WINDOW ROCK	AZ	LP	0	1	0	1	1	0.999977
SAD	SAFFORD REGIONAL	AZ	LPV	0	1	0	1	10	0.999819
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	1	0	1	1	0.999977
SOW	SHOW LOW REGIONAL	AZ	LPV	0	1	0	1	2	0.999969
TUS	TUCSON INTL	AZ	LPV	0	1	0	1	88	0.996956
CYBL	CAMPBELL RIVER	BC	LPV	0	1	1	0.999915	1	0.999896
CYCD	NANAIMO	BC	LPV	0	1	1	0.999942	1	0.999923
CYVR	VANCOUVER INTL	BC	LPV	0	1	1	0.999958	1	0.999954
CYXS	PRINCE GEORGE	BC	LPV	0	1	0	1	0	1
CYYJ	VICTORIA INTL	BC	LPV	0	1	1	0.999938	1	0.999931
CZBB	VANCOUVER / BOUNDARY BAY	BC	LPV	0	1	1	0.999958	1	0.999958
AAT	ALTURAS MUNICIPAL	CA	LPV	0	1	0	1	3	0.999784
ACV	ARCATA	CA	LPV200	0	1	1	0.999799	90	0.987805
APC	NAPA COUNTY	CA	LPV	0	1	1	0.999877	91	0.992546
APV	APPLE VALLEY	CA	LPV	0	1	0	1	1	0.999981
AUN	AUBURN MUNICIPAL	CA	LPV	0	1	1	0.999942	72	0.998711
BFL	MEADOWS FIELD	CA	LPV200	0	1	0	1	0	1
BLH	BLYTHE	CA	LP	0	1	0	1	7	0.999965
C83	BYRON	CA	LPV	0	1	1	0.999911	90	0.994973

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CCR	BUCHANAN FIELD	CA	LPV	0	1	1	0.999888	91	0.993202
CEC	JACK MC NAMARA FIELD	CA	LPV	0	1	1	0.999796	90	0.988376
CIC	CHICO MUNICIPAL	CA	LPV	0	1	1	0.999904	89	0.996327
CMA	CAMARILLO	CA	LPV	0	1	0	1	10	0.999753
CNO	CHINO	CA	LPV	0	1	0	1	1	0.999996
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	1	0	1	1	0.999996
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	1	1	0.999919	96	0.994973
DAG	BARSTOW-DAGGETT	CA	LPV	0	1	0	1	1	0.999973
DWA	YOLO COUNTY-DAVIS/WOODLAND/WINTERS	CA	LPV	0	1	1	0.999904	89	0.995170
FAT	FRESNO YOSEMITE INTL	CA	LPV	0	1	0	1	1	0.999996
HAF	HALF MOON BAY	CA	LPV	0	1	2	0.999857	98	0.990131
HHR	HAWTHORNE JACK NORTHROP FIELD	CA	LPV	0	1	0	1	2	0.999992
HWD	HAYWARD EXECUTIVE	CA	LPV	0	1	1	0.999880	94	0.992346
LAX	LOS ANGELES INTL	CA	LPV	0	1	0	1	2	0.999981
LGB	LONG BEACH/DAUGHERTY FIELD	CA	LPV	0	1	0	1	0	1
LHM	LINCOLN REGIONAL/KARL HARDER FIELD	CA	LPV200	0	1	1	0.999931	88	0.997832
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	1	1	0.999950	78	0.997863
LVK	LIVERMORE MUNICIPAL	CA	LPV	0	1	1	0.999900	91	0.993804
MAE	MADERA MUNICIPAL	CA	LPV	0	1	1	0.999992	23	0.999715
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	1	1	0.999969	44	0.999201
MER	CASTLE	CA	LPV200	0	1	1	0.999969	50	0.999147
MHR	SACRAMENTO MATHER	CA	LPV200	0	1	1	0.999927	89	0.997512
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	1	0	1	0	1
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	1	1	0.999946	81	0.997755
MRY	MONTEREY PENINSULA	CA	LPV	0	1	1	0.999892	102	0.991968
MYF	MONTGOMERY FIELD	CA	LPV200	0	1	0	1	1	0.999996
MYV	YUBA COUNTY	CA	LPV200	0	1	1	0.999915	89	0.996975
O02	NERVINO	CA	LPV	0	1	1	0.999977	12	0.999780
O27	OAKDALE	CA	LPV	0	1	1	0.999954	65	0.998565
O69	PETALUMA MUNICIPAL	CA	LPV	0	1	1	0.999857	93	0.991146
O88	RIO VISTA MUNICIPAL	CA	LP	0	1	1	0.999907	89	0.994915
OAK	METROPOLITAN OAKLAND INTL	CA	LPV	0	1	1	0.999877	94	0.991991
ONT	ONTARIO INTL	CA	LPV	0	1	0	1	1	0.999996
OVE	OROVILLE MUNICIPAL	CA	LPV	0	1	1	0.999915	89	0.997180
OXR	OXNARD	CA	LPV	0	1	0	1	10	0.999676
PMD	PALMDALE REGIONAL/USAF PLANT 42	CA	LPV200	0	1	0	1	1	0.999996
POC	BRACKETT FIELD	CA	LPV	0	1	0	1	1	0.999996
PRB	PASO ROBLES MUNICIPALCIPAL	CA	LPV200	0	1	1	0.999961	83	0.997492
PVF	PLACERVILLE	CA	LPV	0	1	1	0.999958	41	0.999367
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	1	0	1	1	0.999992
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	1	1	0.999888	90	0.995810
RDD	REDDING MUNICIPAL	CA	LPV	0	1	1	0.999904	90	0.996597

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
RHV	REID-HILLVIEW OF SANTA CLARA	CA	LPV	0	1	1	0.999896	96	0.993368
SAC	SACRAMENTO EXECUTIVE	CA	LPV200	0	1	1	0.999919	89	0.996574
SAN	SAN DIEGO INTL	CA	LP	0	1	0	1	1	0.999996
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	1	0	1	34	0.998781
SBP	SAN LUIS COUNTY REGIONAL	CA	LPV200	0	1	1	0.999958	93	0.996755
SCK	STOCKTON METROPOLITAN	CA	LPV	0	1	1	0.999934	89	0.996678
SEE	GILLESPIE FIELD	CA	LP	0	1	0	1	1	0.999996
SFO	SAN FRANCISCO INTL	CA	LPV	0	1	1	0.999869	98	0.991107
SJC	NORMAN Y. MINETA SAN JOSE INTL	CA	LPV	0	1	1	0.999892	97	0.992867
SMF	SACRAMENTO INTL	CA	LPV200	0	1	1	0.999915	89	0.996528
SMX	SANTA MARIA PUBLIC/CAPT G ALLAN HANCOCK FIELD	CA	LPV200	0	1	1	0.999969	85	0.997226
SNA	JOHN WAYNE-ORANGE COUNTY	CA	LPV	0	1	0	1	0	1
SNS	SALINAS MUNICIPAL	CA	LPV200	0	1	1	0.999904	97	0.993468
STS	CHARLES M. SCHULZ-SONOMA COUNTY	CA	LPV	0	1	1	0.999850	93	0.990390
TCY	TRACY MUNICIPAL	CA	LPV	0	1	1	0.999919	90	0.995679
VCB	NUT TREE	CA	LPV	0	1	1	0.999892	89	0.994171
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	1	0	1	1	0.999985
VIS	VISALIA MUNICIPAL	CA	LPV200	0	1	0	1	0	1
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	1	0	1	0	1
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	1	1	0.999888	90	0.994614
ALS	SAN LUIS VALLEY REGIONAL/BERGMAN FIELD	CO	LPV200	0	1	0	1	1	0.999992
APA	CENTENNIAL	CO	LPV	0	1	0	1	1	0.999927
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	1	0	1	1	0.999923
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	1	0	1	0	1
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	1	0	1	1	0.999938
DEN	DENVER INTL	CO	LPV200	0	1	0	1	1	0.999919
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	1	0	1	0	1
FNL	FORT COLLINS-LOVELAND MUNICIPAL	CO	LPV200	0	1	0	1	1	0.999911
FTG	FRONT RANGE	CO	LPV	0	1	0	1	1	0.999919
GJT	GRAND JUNCTION RGNL	CO	LPV200	0	1	0	1	0	1
GXY	GREELEY-WELD COUNTY	CO	LPV	0	1	0	1	1	0.999907
HDN	YAMPA VALLEY	CO	LPV	0	1	0	1	0	1
ITR	KIT CARSON COUNTY	CO	LPV	0	1	0	1	1	0.999919
LAA	LAMAR MUNICIPAL	CO	LPV	0	1	0	1	1	0.999969
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	1	0	1	1	0.999973
MTJ	MONTROSE REGIONAL	CO	LPV	0	1	0	1	0	1
PUB	PUEBLO MEMORIAL	CO	LPV200	0	1	0	1	1	0.999961
RIL	GARFIELD COUNTY REGIONAL	CO	LPV	0	1	0	1	0	1
TEX	TELLURIDE REGIONAL	CO	LP	0	1	0	1	1	0.999996
BDL	BRADLEY INTL	CT	LPV200	0	1	0	1	1	0.999969
GON	GROTON-NEW LONDON	CT	LPV	0	1	0	1	1	0.999969

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
HVN	TWEED-NEW HAVEN	CT	LPV	0	1	0	1	1	0.999988
IJD	WINDHAM	CT	LP	0	1	0	1	1	0.999965
OXC	WATERBURY-OXFORD	CT	LPV	0	1	0	1	1	0.999988
DCA	RONALD REAGAN WASHINGTON NATL	DC	LPV	0	1	0	1	0	1
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	1	0	1	0	1
EVY	SUMMIT	DE	LPV	0	1	0	1	0	1
GED	SUSSEX COUNTY	DE	LPV	0	1	0	1	0	1
ILG	NEW CASTLE	DE	LPV	0	1	0	1	0	1
1J0	TRI-COUNTY	FL	LP	0	1	0	1	0	1
28J	PALATKA MUNICIPALCIPAL ARPT	FL	LPV	0	1	0	1	1	0.999911
40J	PERRY-FOLEY	FL	LPV	0	1	0	1	1	0.999996
54J	DEFUNIAK SPRINGS	FL	LP	0	1	0	1	0	1
AAF	APALACHICOLA MUNICIPAL	FL	LPV	0	1	0	1	0	1
APF	NAPLES MUNICIPAL	FL	LPV	0	1	0	1	2	0.999498
AVO	AVON PARK EXECUTIVE	FL	LPV	0	1	0	1	2	0.999688
BCT	BOCA RATON	FL	LPV	0	1	0	1	3	0.999402
BKV	HERNANDO COUNTY	FL	LPV	0	1	0	1	1	0.999853
BOW	BARTOW MUNICIPAL	FL	LPV	0	1	0	1	1	0.999815
CEW	BOB SIKES	FL	LPV	0	1	0	1	0	1
COI	MERRITT ISLAND	FL	LPV	0	1	0	1	1	0.999826
CRG	CRAIG MUNICIPAL	FL	LPV200	0	1	0	1	1	0.999934
CTY	CROSS CITY	FL	LPV	0	1	0	1	1	0.999934
DAB	DAYTONA BEACH INTL	FL	LPV200	0	1	0	1	1	0.999850
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FLD	FL	LPV	0	1	0	1	1	0.999850
DTS	DESTIN-FORT WALTON BEACH	FL	LP	0	1	0	1	0	1
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	1	0	1	0	1
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	1	0	1	1	0.999850
EYW	KEY WEST INTL	FL	LPV	0	1	0	1	34	0.998962
F45	NORTH PALM BEACH COUNTY GENERAL AVIATION	FL	LPV	0	1	0	1	2	0.999456
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	1	0	1	1	0.999961
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV	0	1	0	1	4	0.999329
FMY	PAGE FIELD	FL	LPV	0	1	0	1	2	0.999522
FPR	ST LUCIE COUNTY INTL	FL	LPV	0	1	0	1	2	0.999606
FXE	FT LAUDERDALE EXECUTIVE	FL	LPV200	0	1	0	1	3	0.999390
GIF	WINTER HAVEN'S GILBERT	FL	LPV	0	1	0	1	1	0.999830
GNV	GAINESVILLE RGNL	FL	LPV	0	1	0	1	1	0.999919
HEG	HERLONG RECREATIONAL	FL	LP	0	1	0	1	1	0.999934
IMM	IMMOKALEE RGNL	FL	LPV	0	1	0	1	2	0.999495
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	1	0	1	1	0.999834
JAX	JACKSONVILLE INTL	FL	LPV200	0	1	0	1	1	0.999946
LAL	LAKELAND LINDER REGIONAL	FL	LPV200	0	1	0	1	1	0.999830
LCQ	LAKE CITY MUNICIPAL	FL	LPV	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
LEE	LEESBURG INTL	FL	LPV	0	1	0	1	1	0.999853
MCO	ORLANDO INTL	FL	LPV200	0	1	0	1	1	0.999838
MIA	MIAMI INTL	FL	LPV	0	1	0	1	5	0.999313
MKY	MARCO ISLAND	FL	LPV	0	1	0	1	2	0.999483
MLB	MELBOURNE INTL	FL	LPV	0	1	0	1	2	0.999803
MTH	THE FLORIDA KEYS MARATHON	FL	LPV	0	1	0	1	21	0.999132
OBE	OKEECHOBEE COUNTY	FL	LPV	0	1	0	1	2	0.999545
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	0	1	0	1	1	0.999865
OPF	OPA LOCKA	FL	LPV200	0	1	0	1	4	0.999325
ORL	ORLANDO EXECUTIVE	FL	LPV200	0	1	0	1	1	0.999838
PBI	PALM BEACH INTL	FL	LPV200	0	1	0	1	2	0.999433
PCM	PLANT CITY MUNICIPAL	FL	LPV	0	1	0	1	1	0.999830
PGD	CHARLOTTE COUNTY	FL	LPV200	0	1	0	1	2	0.999556
PHK	PALM BEACH COUNTY GLADES	FL	LPV	0	1	0	1	2	0.999495
PIE	ST PETERSBURG-CLEARWATER INTL	FL	LPV200	0	1	0	1	1	0.999846
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	1	0	1	3	0.999390
PNS	PENSACOLA RGNL	FL	LPV	0	1	0	1	0	1
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	1	0	1	2	0.999518
SEF	SEBRING REGIONAL	FL	LPV	0	1	0	1	2	0.999622
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	1	0	1	1	0.999838
SGJ	ST AUGUSTINE	FL	LPV	0	1	0	1	1	0.999915
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	1	0	1	2	0.999811
SUA	WITHAM FIELD	FL	LPV	0	1	0	1	2	0.999514
TIX	SPACE COAST REGIONAL	FL	LPV200	0	1	0	1	1	0.999834
TLH	TALLAHASSEE REGIONAL	FL	LPV	0	1	0	1	0	1
TMB	KENDALL-TAMIAMI EXECUTIVE	FL	LPV200	0	1	0	1	5	0.999313
TPA	TAMPA INTL	FL	LPV200	0	1	0	1	1	0.999842
TPF	PETER O KNIGHT	FL	LP	0	1	0	1	1	0.999834
VDF	TAMPA EXECUTIVE	FL	LPV	0	1	0	1	1	0.999838
VNC	VENICE MUNICIPAL	FL	LP	0	1	0	1	2	0.999657
VQQ	CECIL FIELD	FL	LPV	0	1	0	1	1	0.999934
VRB	VERO BEACH MUNICIPAL	FL	LPV	0	1	0	1	2	0.999614
X07	LAKE WALES MUNICIPAL	FL	LP	0	1	0	1	2	0.999811
X14	LA BELLE MUNICIPAL	FL	LPV	0	1	0	1	2	0.999518
X35	MARION CO & PARK OF COMMERCE	FL	LP	0	1	0	1	1	0.999869
X51	HOMESTEAD GENERAL AVIATION	FL	LPV	0	1	0	1	4	0.999306
XFL	FLAGLER COUNTY	FL	LPV	0	1	0	1	1	0.999853
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	1	0	1	1	0.999842
09J	JEKYLL ISLAND	GA	LPV200	0	1	0	1	0	1
15J	COOK COUNTY	GA	LPV	0	1	0	1	0	1
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	1	0	1	0	1
18A	FRANKLIN COUNTY	GA	LPV	0	1	0	1	0	1
19A	JACKSON COUNTY	GA	LPV	0	1	0	1	0	1
2J5	MILLEN	GA	LPV	0	1	0	1	0	1
3J7	GREENE COUNTY REGIONAL	GA	LPV	0	1	0	1	0	1
48A	COCHRAN	GA	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
4A4	POLK COUNTY AIRPORT CORNELIUS MOORE FIELD	GA	LPV	0	1	0	1	0	1
4J1	BRANTLEY COUNTY	GA	LPV	0	1	0	1	0	1
4J6	ST MARYS	GA	LPV	0	1	0	1	0	1
52A	MADISON MUNICIPAL	GA	LP	0	1	0	1	0	1
70J	CAIRO-GRADY COUNTY	GA	LPV	0	1	0	1	0	1
ABY	SOUTHWEST GEORGIA REGIONAL	GA	LPV200	0	1	0	1	0	1
ACJ	JIMMY CARTER RGNL	GA	LPV	0	1	0	1	0	1
AGS	AUGUSTA REGIONAL AT BUSH FIELD	GA	LPV	0	1	0	1	0	1
AHN	ATHENS/BEN EPPS	GA	LPV	0	1	0	1	0	1
AJR	HABERSHAM COUNTY	GA	LPV	0	1	0	1	0	1
ATL	HARTSFIELD - JACKSON ATLANTA INTL	GA	LPV200	0	1	0	1	0	1
AYS	WAYCROSS-WARE COUNTY	GA	LPV	0	1	0	1	0	1
BGE	DECATUR COUNTY INDUSTRIAL AIR PARK	GA	LPV200	0	1	0	1	0	1
BHC	BAXLEY MUNICIPAL	GA	LPV	0	1	0	1	0	1
BIJ	EARLY COUNTY	GA	LPV	0	1	0	1	0	1
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	1	0	1	0	1
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	1	0	1	0	1
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	1	0	1	0	1
CNI	CHEROKEE COUNTY	GA	LPV	0	1	0	1	0	1
CSG	COLUMBUS METROPOLITAN	GA	LPV	0	1	0	1	0	1
CTJ	WEST GEORGIA REGIONAL-O V GRAY FIELD	GA	LPV	0	1	0	1	0	1
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	1	0	1	0	1
D73	MONROE-WALTON COUNTY	GA	LP	0	1	0	1	0	1
DNN	DALTON MUNICIPAL	GA	LPV	0	1	0	1	0	1
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	1	0	1	0	1
EZM	HEART OF GEORGIA REGIONAL	GA	LPV	0	1	0	1	0	1
FFC	PEACHTREE CITY-FALCON FIELD	GA	LPV200	0	1	0	1	0	1
FTY	FULTON COUNTY ARPT-BROWN FIELD	GA	LPV	0	1	0	1	0	1
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	1	0	1	0	1
GVL	LEE GILMER MEMORIAL	GA	LPV	0	1	0	1	0	1
HOE	HOMERVILLE	GA	LPV	0	1	0	1	0	1
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	1	0	1	0	1
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	0	1	0	1	0	1
JES	JESUP-WAYNE COUNTY	GA	LPV	0	1	0	1	0	1
JYL	PLANTATION ARPK	GA	LPV	0	1	0	1	0	1
JZP	PICKENS COUNTY	GA	LPV	0	1	0	1	0	1
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	1	0	1	0	1
LZU	GWINNETT COUNTY-BRISCOE FIELD	GA	LPV200	0	1	0	1	0	1
MAC	MACON DOWNTOWN	GA	LP	0	1	0	1	0	1
MCN	MIDDLE GEORGIA REGIONAL	GA	LPV	0	1	0	1	0	1
MGR	MOULTRIE MUNICIPAL	GA	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
MLJ	BALDWIN COUNTY	GA	LPV	0	1	0	1	0	1
MQW	TELFAIR-WHEELER	GA	LPV	0	1	0	1	0	1
OKZ	KAOLIN FIELD	GA	LPV	0	1	0	1	0	1
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	1	0	1	0	1
PIM	HARRIS COUNTY	GA	LPV	0	1	0	1	0	1
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	1	0	1	0	1
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	1	0	1	0	1
RMG	RICHARD B RUSSELL	GA	LPV	0	1	0	1	0	1
RYY	COBB COUNTY-MC COLLUM FIELD	GA	LPV200	0	1	0	1	0	1
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	1	0	1	0	1
SBO	EMANUEL COUNTY	GA	LPV	0	1	0	1	0	1
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	1	0	1	0	1
TMA	HENRY TIFTON MYERS	GA	LPV	0	1	0	1	0	1
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	1	0	1	0	1
TVI	THOMASVILLE REGIONAL	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	0	1
WDR	WINDER-BARROW	GA	LPV	0	1	0	1	0	1
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	1	0	1	0	1
ALO	WATERLOO REGIONAL	IA	LPV	0	1	0	1	0	1
AMW	AMES MUNICIPAL	IA	LPV	0	1	0	1	0	1
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	1	0	1	0	1
BRL	SOUTHEAST IOWA REGIONAL	IA	LPV200	0	1	0	1	0	1
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	1	0	1	0	1
CID	THE EASTERN IOWA	IA	LPV200	0	1	0	1	0	1
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	1	0	1	0	1
CSQ	CRESTON MUNICIPAL	IA	LPV	0	1	0	1	0	1
CWI	CLINTON MUNICIPAL	IA	LPV200	0	1	0	1	0	1
DBQ	DUBUQUE REGIONAL	IA	LPV200	0	1	0	1	0	1
DEH	DECORAH MUNICIPAL	IA	LPV	0	1	0	1	0	1
DNS	DENISON MUNICIPAL	IA	LPV	0	1	0	1	0	1
DSM	DES MOINES INTL	IA	LPV	0	1	0	1	0	1
DVN	DAVENPORT MUNICIPAL	IA	LPV200	0	1	0	1	0	1
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
EFW	JEFFERSON MUNICIPAL	IA	LPV	0	1	0	1	0	1
EOK	KEOKUK MUNICIPAL	IA	LPV	0	1	0	1	0	1
EST	ESTHERVILLE MUNICIPAL	IA	LPV	0	1	0	1	0	1
FFL	FAIRFIELD MUNICIPAL	IA	LPV	0	1	0	1	0	1
FOD	FORT DODGE REGIONAL	IA	LPV200	0	1	0	1	0	1
FXY	FOREST CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
GGI	GRINNELL REGIONAL	IA	LPV	0	1	0	1	0	1
I75	OSCEOLA MUNICIPAL	IA	LPV	0	1	0	1	0	1
ICL	SCHENCK FIELD	IA	LPV	0	1	0	1	0	1
IIB	INDEPENDENCE MUNICIPAL	IA	LP	0	1	0	1	0	1
IKV	ANKENY REGIONAL	IA	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
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
LRJ	LE MARS MUNICIPAL	IA	LPV	0	1	0	1	0	1
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	1	0	1	0	1
MPZ	MOUNT PLEASANT MUNICIPALCIPAL	IA	LPV	0	1	0	1	0	1
MUT	MUSCATINE MUNICIPAL	IA	LPV	0	1	0	1	0	1
MXO	MONTICELLO REGIONAL	IA	LP	0	1	0	1	0	1
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	1	0	1	0	1
OTM	OTTUMWA REGIONAL	IA	LPV	0	1	0	1	0	1
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	1	0	1	0	1
PEA	PELLA MUNICIPAL	IA	LPV	0	1	0	1	0	1
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	1	0	1	0	1
PRO	PERRY MUNICIPAL	IA	LPV200	0	1	0	1	0	1
RDK	RED OAK MUNICIPAL	IA	LPV	0	1	0	1	0	1
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	1	0	1	0	1
SHL	SHELDON MUNICIPAL	IA	LPV	0	1	0	1	0	1
SKI	SAC CITY MUNICIPAL	IA	LPV	0	1	0	1	0	1
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	1	0	1	0	1
SPW	SPENCER MUNICIPAL	IA	LPV200	0	1	0	1	0	1
SUX	SIOUX GATEWAY/COL BUD DAY FIELD	IA	LPV200	0	1	0	1	0	1
TNU	NEWTON MUNICIPAL	IA	LPV	0	1	0	1	0	1
TVK	CENTERVILLE MUNICIPAL	IA	LPV	0	1	0	1	0	1
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	0	1	0	1	0	1
VTI	VINTON VETERANS MEML ARPK	IA	LPV	0	1	0	1	0	1
BOI	BOISE AIR TERMINAL/GOWEN FLD	ID	LPV	0	1	0	1	0	1
COE	PAPPY BOYINGTON FIELD	ID	LPV200	0	1	0	1	0	1
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	1	0	1	0	1
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	1	0	1	0	1
GNG	GOODING MUNICIPAL	ID	LPV	0	1	0	1	0	1
IDA	IDAHO FALLS REGIONAL	ID	LPV200	0	1	0	1	0	1
JER	JEROME COUNTY	ID	LPV	0	1	0	1	0	1
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	0	1	0	1	0	1
MAN	NAMPA MUNICIPAL	ID	LPV	0	1	0	1	0	1
MYL	MC CALL MUNICIPALCIPAL	ID	LPV	0	1	0	1	0	1
PIH	POCATELLO REGIONAL	ID	LPV200	0	1	0	1	0	1
TWF	JOSLIN FIELD-MAGIC VALLEY RGNL	ID	LPV200	0	1	0	1	0	1
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	1	0	1	0	1
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	1	0	1	0	1
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	0	1	0	1	0	1
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	1	0	1	0	1
ALN	ST LOUIS REGIONAL	IL	LPV200	0	1	0	1	0	1
ARR	AURORA MUNICIPAL	IL	LPV200	0	1	0	1	0	1
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	0	1	0	1	0	1
BMI	CENTRAL IL REGL ARPT AT BLOOMINGTON-NORMAL	IL	LPV	0	1	0	1	0	1
C15	PEKIN MUNICIPAL	IL	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
C73	DIXON MUNICIPAL-CHARLES R. WALGREEN FLD	IL	LPV	0	1	0	1	0	1
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	0	1	0	1	0	1
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	1	0	1	0	1
CUL	CARMI MUNICIPAL	IL	LP	0	1	0	1	0	1
DEC	DECATUR	IL	LPV200	0	1	0	1	0	1
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	1	0	1	0	1
DNV	VERMILION COUNTY	IL	LPV	0	1	0	1	0	1
DPA	DUPAGE	IL	LPV200	0	1	0	1	0	1
ENL	CENTRALIA MUNICIPAL	IL	LPV	0	1	0	1	0	1
FEP	ALBERTUS	IL	LPV	0	1	0	1	0	1
FOA	FLORA MUNICIPAL	IL	LPV	0	1	0	1	0	1
HSB	HARRISBURG-RALEIGH	IL	LPV	0	1	0	1	0	1
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	1	0	1	0	1
IGQ	LANSING MUNICIPAL	IL	LPV	0	1	0	1	0	1
IKK	GREATER KANKAKEE	IL	LPV	0	1	0	1	0	1
LOT	LEWIS UNIVERSITY	IL	LPV200	0	1	0	1	0	1
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	1	0	1	0	1
MLI	QUAD CITY INTL	IL	LPV200	0	1	0	1	0	1
MTO	COLES COUNTY MEMORIAL	IL	LPV	0	1	0	1	0	1
MVN	MOUNT VERNON	IL	LPV	0	1	0	1	0	1
MWA	WILLIAMSON COUNTY REGIONAL	IL	LPV	0	1	0	1	0	1
ORD	CHICAGO-O'HARE INTL	IL	LPV200	0	1	0	1	0	1
PIA	GREATER PEORIA REGIONAL	IL	LPV	0	1	0	1	0	1
PNT	PONTIAC MUNICIPAL	IL	LPV	0	1	0	1	0	1
PWK	CHICAGO EXECUTIVE	IL	LPV	0	1	0	1	0	1
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	1	0	1	0	1
RPJ	ROCHELLE MUNICIPAL-KORITZ FIELD	IL	LPV200	0	1	0	1	0	1
RSV	ROBINSON MUNICIPAL	IL	LPV	0	1	0	1	0	1
SFY	TRI-TOWNSHIP	IL	LP	0	1	0	1	0	1
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	1	0	1	0	1
SQI	WHITESIDE COUNTY-JOS J BITTORF FLD	IL	LPV	0	1	0	1	0	1
UGN	WAUKEGAN REGIONAL	IL	LPV	0	1	0	1	0	1
UIN	QUINCY RGNL-BALDWIN FIELD	IL	LPV200	0	1	0	1	0	1
4I7	PUTNAM COUNTY	IN	LPV	0	1	0	1	0	1
AID	ANDERSON MUNICIPAL-DARLINGTON FIELD	IN	LPV	0	1	0	1	0	1
ASW	WARSAW MUNICIPALCIPAL	IN	LPV	0	1	0	1	0	1
BAK	COLUMBUS MUNICIPAL	IN	LPV	0	1	0	1	0	1
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	0	1	0	1	0	1
BMG	MONROE COUNTY	IN	LPV200	0	1	0	1	0	1
CEV	METTEL FIELD	IN	LPV	0	1	0	1	0	1
EKM	ELKHART MUNICIPAL	IN	LPV	0	1	0	1	0	1
EVV	EVANSVILLE RGNL	IN	LPV200	0	1	0	1	0	1
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	1	0	1	0	1
FRH	FRENCH LICK MUNICIPAL	IN	LPV	0	1	0	1	0	1
FWA	FORT WAYNE INTL	IN	LPV200	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	1	0	1	0	1
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	1	0	1	0	1
GSH	GOSHEN MUNICIPAL	IN	LPV	0	1	0	1	0	1
GWB	DE KALB COUNTY	IN	LPV	0	1	0	1	0	1
GYY	GARY/CHICAGO INTL	IN	LPV200	0	1	0	1	0	1
HFY	GREENWOOD MUNICIPAL	IN	LPV	0	1	0	1	0	1
HNB	HUNTINGBURG	IN	LPV	0	1	0	1	0	1
HUF	TERRE HAUTE INTL-HULMAN FIELD	IN	LPV200	0	1	0	1	0	1
I22	RANDOLPH COUNTY	IN	LPV	0	1	0	1	0	1
IMS	MADISON MUNICIPAL	IN	LPV	0	1	0	1	0	1
IND	INDIANAPOLIS INTL	IN	LPV	0	1	0	1	0	1
JVY	CLARK RGNL	IN	LPV200	0	1	0	1	0	1
LAF	PURDUE UNIVERSITY	IN	LPV	0	1	0	1	0	1
MCX	WHITE COUNTY	IN	LP	0	1	0	1	0	1
MIE	DELAWARE COUNTY-JOHNSON FIELD	IN	LPV	0	1	0	1	0	1
MQJ	MOUNT COMFORT	IN	LPV	0	1	0	1	0	1
MZZ	MARION MUNICIPAL	IN	LPV	0	1	0	1	0	1
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	1	0	1	0	1
OVO	NORTH VERNON	IN	LPV	0	1	0	1	0	1
OXI	STARKE COUNTY	IN	LPV	0	1	0	1	0	1
PLD	PORTLAND MUNICIPAL	IN	LPV	0	1	0	1	0	1
RCR	FULTON COUNTY	IN	LPV	0	1	0	1	0	1
RID	RICHMOND MUNICIPAL	IN	LPV200	0	1	0	1	0	1
RZL	JASPER COUNTY	IN	LPV	0	1	0	1	0	1
SBN	SOUTH BEND REGIONAL	IN	LPV	0	1	0	1	0	1
SER	FREEMAN MUNICIPAL	IN	LPV	0	1	0	1	0	1
SMD	SMITH FIELD	IN	LPV	0	1	0	1	0	1
TEL	PERRY COUNTY MUNICIPAL	IN	LP	0	1	0	1	0	1
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	0	1	0	1	0	1
VPZ	PORTER COUNTY MUNICIPAL	IN	LPV	0	1	0	1	0	1
3AU	AUGUSTA MUNICIPAL	KS	LP	0	1	0	1	0	1
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPALCIPAL	KS	LPV	0	1	0	1	1	0.999969
AAO	COLONEL JAMES JABARA	KS	LPV	0	1	0	1	0	1
ADT	ATWOOD-RAWLINS COUNTY CITY-COUNTY	KS	LPV	0	1	0	1	1	0.999904
ANY	ANTHONY MUNICIPAL	KS	LP	0	1	0	1	0	1
CBK	SHALZ FIELD	KS	LPV	0	1	0	1	1	0.999915
CNK	BLOSSER MUNICIPAL	KS	LP	0	1	0	1	0	1
DDC	DODGE CITY REGIONAL	KS	LPV	0	1	0	1	1	0.999988
EGT	WELLINGTON MUNICIPAL	KS	LPV	0	1	0	1	0	1
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	1	0	1	0	1
EMP	EMPORIA MUNICIPAL	KS	LPV	0	1	0	1	0	1
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	1	0	1	0	1
FOE	FORBES FIELD	KS	LPV	0	1	0	1	0	1
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	1	0	1	0	1
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	1	0	1	1	0.999988
GCK	GARDEN CITY REGIONAL	KS	LPV	0	1	0	1	1	0.999977

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
GLD	RENNER FLD/GOODLAND MUNICIPAL/	KS	LPV200	0	1	0	1	1	0.999915
HQG	HUGOTON MUNICIPAL	KS	LPV	0	1	0	1	0	1
HUT	HUTCHINSON MUNICIPAL	KS	LPV	0	1	0	1	0	1
HYS	HAYS REGIONAL	KS	LPV200	0	1	0	1	1	0.999973
ICT	WICHITA MID-CONTINENT	KS	LPV200	0	1	0	1	0	1
IDP	INDEPENDENCE MUNICIPAL	KS	LPV	0	1	0	1	0	1
IXD	NEW CENTURY AIRCENTER	KS	LPV	0	1	0	1	0	1
K88	ALLEN COUNTY	KS	LPV	0	1	0	1	0	1
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV	0	1	0	1	0	1
LQR	LARNED PAWNEE CO	KS	LPV	0	1	0	1	1	0.999988
LWC	LAWRENCE MUNICIPAL	KS	LPV200	0	1	0	1	0	1
MHK	MANHATTAN REGIONAL	KS	LPV200	0	1	0	1	0	1
MPR	MCPHERSON	KS	LPV	0	1	0	1	0	1
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	0	1	0	1	0	1
NRN	NORTON MUNICIPAL	KS	LPV	0	1	0	1	0	1
OEL	OAKLEY MUNICIPAL	KS	LPV	0	1	0	1	1	0.999927
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	1	0	1	0	1
OWI	OTTAWA MUNICIPAL	KS	LP	0	1	0	1	0	1
PPF	TRI-CITY	KS	LPV	0	1	0	1	0	1
PTS	ATKINSON MUNICIPAL	KS	LPV	0	1	0	1	0	1
PTT	PRATT INDUSTRIAL	KS	LPV	0	1	0	1	0	1
RPB	BELLEVILLE MUNICIPAL	KS	LPV	0	1	0	1	0	1
RSL	RUSSELL MUNICIPAL	KS	LPV	0	1	0	1	0	1
SLN	SALINA MUNICIPAL	KS	LPV	0	1	0	1	0	1
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV200	0	1	0	1	0	1
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	1	0	1	1	0.999950
UKL	COFFEY COUNTY	KS	LPV	0	1	0	1	0	1
ULS	ULYSSES	KS	LPV	0	1	0	1	1	0.999985
27K	GEORGETOWN SCOTT CO-MARSHALL FLD	KY	LPV200	0	1	0	1	0	1
2I0	MADISONVILLE MUNICIPAL	KY	LPV	0	1	0	1	0	1
6I2	LEBANON-SPRINGFIELD	KY	LP	0	1	0	1	0	1
7K4	OHIO COUNTY	KY	LPV	0	1	0	1	0	1
AAS	TAYLOR COUNTY	KY	LP	0	1	0	1	0	1
BRY	SAMUELS FIELD	KY	LPV	0	1	0	1	0	1
BWG	BOWLING GREEN-WARREN CTY RGNL	KY	LPV	0	1	0	1	0	1
CEY	KYLE-OAKLEY FIELD	KY	LPV	0	1	0	1	0	1
CVG	CINCINNATI/NORTHERN KENTUCKY INTL	KY	LPV200	0	1	0	1	0	1
DVK	STUART POWELL FIELD	KY	LPV	0	1	0	1	0	1
DWU	ASHLAND REGIONAL	KY	LP	0	1	0	1	0	1
EHR	HENDERSON CITY-COUNTY	KY	LPV	0	1	0	1	0	1
EKX	ADDINGTON FIELD	KY	LPV	0	1	0	1	0	1
FGX	FLEMING-MASON	KY	LPV	0	1	0	1	0	1
GLW	GLASGOW MUNICIPAL	KY	LPV	0	1	0	1	0	1
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	0	1	0	1	0	1
I39	MADISON	KY	LPV	0	1	0	1	0	1
K22	BIG SANDY REGIONAL	KY	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
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	0	1	0	1	0	1
LEX	BLUE GRASS	KY	LPV	0	1	0	1	0	1
LOU	BOWMAN FIELD	KY	LP	0	1	0	1	0	1
LOZ	LONDON-CORBIN ARPT-MAGEE FLD	KY	LPV	0	1	0	1	0	1
M21	MUHLENBERG COUNTY	KY	LP	0	1	0	1	0	1
M97	MOREHEAD-ROWAN COUNTY CLYDE A THOMAS RGNL	KY	LPV	0	1	0	1	0	1
OWB	OWENSBORO-DAVIESS COUNTY	KY	LPV200	0	1	0	1	0	1
PAH	BARKLEY REGIONAL	KY	LPV	0	1	0	1	0	1
SDF	LOUISVILLE INTL-STANDIFORD FLD	KY	LPV200	0	1	0	1	0	1
SME	LAKE CUMBERLAND REGIONAL	KY	LPV	0	1	0	1	0	1
TWT	STURGIS MUNICIPAL	KY	LPV	0	1	0	1	0	1
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	0	1	0	1	0	1
1L0	ST JOHN THE BAPTIST PARISH	LA	LPV	0	1	0	1	0	1
3R4	HART	LA	LPV	0	1	0	1	0	1
ACP	ALLEN PARISH	LA	LPV	0	1	0	1	0	1
AEX	ALEXANDRIA INTL	LA	LPV200	0	1	0	1	0	1
ARA	ACADIANA REGIONAL	LA	LPV	0	1	0	1	0	1
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	1	0	1	0	1
BTR	BATON ROUGE METRO	LA	LPV200	0	1	0	1	0	1
BXA	GEORGE R CARR MEMORIAL AIR FIELD	LA	LPV	0	1	0	1	0	1
CWF	CHENNAULT INTL	LA	LPV200	0	1	0	1	0	1
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	1	0	1	0	1
ESF	ESLER REGIONAL	LA	LPV200	0	1	0	1	0	1
F88	JONESBORO	LA	LP	0	1	0	1	0	1
GAO	SOUTH LAFOURCHE LEONARD MILLER JR	LA	LPV	0	1	0	1	0	1
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	1	0	1	0	1
HUM	HOUMA-TERREBONNE	LA	LPV200	0	1	0	1	0	1
HZR	FALSE RIVER RGNL	LA	LPV	0	1	0	1	0	1
IER	NATCHITOCHES REGIONAL	LA	LPV	0	1	0	1	0	1
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	0	1	0	1	0	1
L39	LEESVILLE	LA	LPV	0	1	0	1	0	1
LCH	LAKE CHARLES REGIONAL	LA	LPV	0	1	0	1	0	1
LFT	LAFAYETTE REGIONAL	LA	LPV	0	1	0	1	0	1
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	1	0	1	0	1
MLU	MONROE REGIONAL	LA	LPV200	0	1	0	1	0	1
MSY	LOUIS ARMSTRONG NEW ORLEANS INTL	LA	LPV200	0	1	0	1	0	1
NEW	LAKEFRONT	LA	LPV	0	1	0	1	0	1
OPL	ST LANDRY PARISH-AHART FIELD	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
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	1	0	1	0	1
RSN	RUSTON RGNL AIRPORT	LA	LPV	0	1	0	1	0	1
SHV	SHREVEPORT REGIONAL	LA	LPV200	0	1	0	1	0	1
SPH	SPRINGHILL	LA	LPV	0	1	0	1	0	1
TVR	VICKSBURG TALLULAH REGIONAL	LA	LPV	0	1	0	1	0	1
UXL	SOUTHLAND FIELD	LA	LPV	0	1	0	1	0	1
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	0	1	0	1	1	0.999961
ACK	NANTUCKET MEMORIAL	MA	LPV200	0	1	0	1	1	0.999931
BAF	BARNES MUNICIPAL	MA	LPV	0	1	0	1	1	0.999969
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	1	0	1	1	0.999938
BOS	GEN EDWARD LAWRENCE LOGAN INTL	MA	LPV200	0	1	0	1	1	0.999934
BVY	BEVERLY MUNICIPAL	MA	LPV	0	1	0	1	1	0.999931
EWB	NEW BEDFORD REGIONAL	MA	LP	0	1	0	1	1	0.999942
GBR	WALTER J KOLADZA	MA	LP	0	1	0	1	1	0.999985
HYA	BARNSTABLE MUNICIPAL-BOARDMAN/POLANDO FIELD	MA	LPV200	0	1	0	1	1	0.999931
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	1	0	1	1	0.999931
MVY	MARTHAS VINEYARD	MA	LPV200	0	1	0	1	1	0.999942
ORE	ORANGE MUNICIPAL	MA	LPV	0	1	0	1	1	0.999958
ORH	WORCESTER REGIONAL	MA	LPV200	0	1	0	1	1	0.999950
OWD	NORWOOD MEMORIAL	MA	LPV	0	1	0	1	1	0.999938
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	1	0	1	1	0.999938
2G4	GARRETT COUNTY	MD	LPV	0	1	0	1	0	1
2W6	ST. MARY'S COUNTY RGNL	MD	LPV	0	1	0	1	0	1
BWI	BALTIMORE-WASHINGTON INTL THURGOOD MARSHALL	MD	LPV200	0	1	0	1	0	1
CBE	GREATER CUMBERLAND REGIONAL	MD	LP	0	1	0	1	0	1
DMW	CARROLL COUNTY REGNL/JACK B POAGE FIELD	MD	LPV200	0	1	0	1	0	1
ESN	EASTON/NEWNAM FIELD	MD	LPV	0	1	0	1	0	1
FDK	FREDERICK MUNICIPAL	MD	LPV	0	1	0	1	0	1
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	1	0	1	0	1
HGR	HAGERSTOWN RGNL-RICHARD A HENSON FIELD	MD	LPV200	0	1	0	1	0	1
MTN	MARTIN STATE	MD	LPV	0	1	0	1	0	1
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	1	0	1	0	1
SBY	SALISBURY-OCEAN CITY WICOMICO REGIONAL	MD	LPV200	0	1	0	1	0	1
1B0	DEXTER REGIONAL	ME	LP	0	1	0	1	2	0.999715
AUG	AUGUSTA STATE	ME	LPV200	0	1	0	1	1	0.999884
BGR	BANGOR INTL	ME	LPV	0	1	0	1	2	0.999718
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	0	1	0	1	1	0.999865
BXM	BRUNSWICK EXECUTIVE	ME	LPV	0	1	0	1	1	0.999892
FVE	NORTHERN AROOSTOOK REGIONAL	ME	LPV	1	0.999769	2	0.999734	2	0.999228

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
HUL	HOULTON INTL	ME	LP	0	1	1	0.999996	2	0.999279
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	0	1	0	1	1	0.999896
MLT	MILLINOCKET MUNICIPAL	ME	LPV	0	1	0	1	2	0.999572
PQI	NORTHERN MAINE REGIONAL ARPT AT PRESQUE IS	ME	LPV200	1	0.999973	3	0.999865	2	0.999263
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	1	0	1	1	0.999900
RKD	KNOX COUNTY REGIONAL	ME	LPV	0	1	0	1	1	0.999880
SFM	SANFORD REGIONAL	ME	LPV200	0	1	0	1	1	0.999915
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	1	0	1	1	0.999880
77G	MARLETTE	MI	LPV	0	1	0	1	0	1
9D9	HASTINGS	MI	LP	0	1	0	1	0	1
ACB	ANTRIM COUNTY	MI	LPV	0	1	0	1	0	1
ADG	LENAWEE COUNTY	MI	LPV	0	1	0	1	0	1
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	0	1	0	1	0	1
ANJ	SAULT STE MARIE MUNICIPAL - SANDERSON FIELD	MI	LPV	0	1	0	1	1	0.999985
APN	ALPENA COUNTY REGIONAL	MI	LPV	0	1	0	1	1	0.999996
ARB	ANN ARBOR MUNICIPAL	MI	LPV	0	1	0	1	0	1
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV	0	1	0	1	0	1
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	1	0	1	0	1
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV	0	1	0	1	0	1
BIV	TULIP CITY	MI	LPV	0	1	0	1	0	1
BTL	W K KELLOGG	MI	LPV200	0	1	0	1	0	1
CAD	WEXFORD COUNTY	MI	LPV200	0	1	0	1	0	1
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	1	0	1	1	0.999985
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	0	1	0	1	1	0.999996
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	0	1	0	1	0	1
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	0	1	0	1	0	1
DTW	DETROIT METROPOLITAN WAYNE COUNTY	MI	LPV200	0	1	0	1	0	1
ERY	LUCE COUNTY	MI	LPV	0	1	0	1	1	0.999988
ESC	DELTA COUNTY	MI	LPV200	0	1	0	1	0	1
FFX	FREMONT MUNICIPAL	MI	LPV	0	1	0	1	0	1
FNT	BISHOP INTL	MI	LPV200	0	1	0	1	0	1
GDW	GLADWIN ZETTEL MEMORIAL	MI	LP	0	1	0	1	0	1
GLR	GAYLORD RGNL	MI	LPV	0	1	0	1	0	1
GRR	GERALD R. FORD INTL	MI	LPV200	0	1	0	1	0	1
HYX	SAGINAW COUNTY H.W. BROWNE	MI	LPV	0	1	0	1	0	1
IKW	JACK BARSTOW	MI	LPV	0	1	0	1	0	1
IMT	FORD	MI	LPV	0	1	0	1	0	1
IRS	KIRSCH MUNICIPAL	MI	LPV	0	1	0	1	0	1
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	1	0	1	1	0.999996
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	1	0	1	0	1
JXN	JACKSON COUNTY-REYNOLDS FIELD	MI	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
LAN	CAPITAL CITY	MI	LPV200	0	1	0	1	0	1
LDM	MASON COUNTY	MI	LPV	0	1	0	1	0	1
LWA	SOUTH HAVEN AREA REGIONAL	MI	LP	0	1	0	1	0	1
MBS	MBS INTL	MI	LPV200	0	1	0	1	0	1
MKG	MUSKEGON COUNTY	MI	LPV200	0	1	0	1	0	1
MNM	MENOMINEE-MARINETTE TWIN COUNTY	MI	LPV200	0	1	0	1	0	1
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	0	1	0	1	0	1
N98	BOYNE CITY MUNICIPAL	MI	LP	0	1	0	1	0	1
OEB	BRANCH COUNTY MEMORIAL	MI	LPV	0	1	0	1	0	1
OSC	OSCODA-WURTSMITH	MI	LPV200	0	1	0	1	0	1
OZW	LIVINGSTON COUNTY SPENCER J HARDY	MI	LPV200	0	1	0	1	0	1
PHN	SAINT CLAIR COUNTY INTL	MI	LPV200	0	1	0	1	0	1
PLN	PELLSTON RGNL ARPT OF EMMET COUNTY	MI	LPV200	0	1	0	1	1	0.999996
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	1	0	1	0	1
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	0	1	0	1	0	1
SAW	SAWYER INTL	MI	LPV200	0	1	0	1	0	1
SLH	CHEBOYGAN COUNTY	MI	LPV	0	1	0	1	1	0.999996
TTF	CUSTER	MI	LPV	0	1	0	1	0	1
TVC	CHERRY CAPITAL	MI	LPV	0	1	0	1	0	1
YIP	WILLOW RUN	MI	LPV	0	1	0	1	0	1
AEL	ALBERT LEA MUNICIPAL	MN	LPV	0	1	0	1	0	1
ANE	ANOKA COUNTY-BLAINE ARPT (JANES FIELD)	MN	LPV	0	1	0	1	0	1
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	1	0	1	0	1
AXN	CHANDLER FIELD	MN	LPV	0	1	0	1	0	1
BBB	BENSON MUNICIPAL	MN	LPV	0	1	0	1	0	1
BDE	BAUDETTE INTL	MN	LPV	0	1	0	1	0	1
BDH	WILLMAR MUNICIPAL-JOHN L RICE FIELD	MN	LPV	0	1	0	1	0	1
BJI	BEMIDJI REGIONAL	MN	LPV200	0	1	0	1	0	1
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	1	0	1	0	1
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	1	0	1	0	1
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	1	0	1	1	0.999996
CKN	CROOKSTON MUNICIPAL/KIRKWOOD FLD	MN	LPV	0	1	0	1	0	1
CNB	MYERS FIELD	MN	LPV	0	1	0	1	0	1
CQM	COOK MUNICIPAL	MN	LP	0	1	0	1	0	1
D39	SAUK CENTRE MUNICIPAL	MN	LP	0	1	0	1	0	1
DLH	DULUTH INTL	MN	LPV200	0	1	0	1	0	1
DTL	DETROIT LAKES-WETHING FIELD	MN	LPV	0	1	0	1	0	1
ELO	ELY MUNICIPAL	MN	LPV200	0	1	0	1	0	1
FCM	FLYING CLOUD	MN	LPV200	0	1	0	1	0	1
FFM	FERGUS FALLS MUNICIPAL-EINAR MICKELSON FLD	MN	LPV200	0	1	0	1	0	1
FOZ	BIGFORK MUNICIPALCIPAL	MN	LP	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
FRM	FAIRMONT MUNICIPAL	MN	LPV	0	1	0	1	0	1
FSE	FOSSTON MUNICIPAL	MN	LP	0	1	0	1	0	1
GPZ	GRAND RAPIDS/ITASCA CO-GORDON NEWSTROM	MN	LPV	0	1	0	1	0	1
HCD	HUTCHINSON MUNICIPAL-BUTLER FIELD	MN	LPV	0	1	0	1	0	1
HIB	CHISHOLM-HIBBING	MN	LPV200	0	1	0	1	0	1
INL	FALLS INTL	MN	LPV	0	1	0	1	1	0.999996
LJF	LITCHFIELD MUNICIPALCIPAL	MN	LPV	0	1	0	1	0	1
LVN	AIRLAKE	MN	LPV200	0	1	0	1	0	1
LXL	LITTLE FALLS/MORRISON CO-LINDBERGH FLD	MN	LPV	0	1	0	1	0	1
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	1	0	1	0	1
MGG	MAPLE LAKE MUNICIPAL	MN	LP	0	1	0	1	0	1
MKT	MANKATO REGIONAL	MN	LPV200	0	1	0	1	0	1
MML	SOUTHWEST MINNESOTA RGNL MARSHALL/RYAN FIELD	MN	LPV200	0	1	0	1	0	1
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN	MN	LPV200	0	1	0	1	0	1
ORB	ORR REGIONAL	MN	LP	0	1	0	1	0	1
OWA	OWATONNA DEGNER RNGL	MN	LPV200	0	1	0	1	0	1
PKD	PARK RAPIDS MUNICIPAL-KONSHOK FIELD	MN	LPV200	0	1	0	1	0	1
RGK	RED WING RGNL	MN	LPV200	0	1	0	1	0	1
ROS	RUSH CITY REGIONAL	MN	LPV	0	1	0	1	0	1
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FIELD	MN	LPV	0	1	0	1	0	1
RRT	WARROAD INTL MEMORIAL	MN	LPV	0	1	0	1	0	1
RST	ROCHESTER INTL	MN	LPV200	0	1	0	1	0	1
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	1	0	1	0	1
SAZ	STAPLES MUNICIPAL	MN	LPV	0	1	0	1	0	1
STC	ST CLOUD REGIONAL	MN	LPV200	0	1	0	1	0	1
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	1	0	1	0	1
TVF	THIEF RIVER FALLS	MN	LPV	0	1	0	1	0	1
TWM	RICHARD B HELGESON	MN	LPV	0	1	0	1	0	1
VVV	ORTONVILLE MUNICIPAL-MARTINSON FIELD	MN	LP	0	1	0	1	0	1
1H0	CREVE COEUR	MO	LPV	0	1	0	1	0	1
2H2	JERRY SUMNERS SR AURORA MUNICIPALCIPAL	MO	LP	0	1	0	1	0	1
6M6	LEWIS COUNTY REGIONAL	MO	LPV	0	1	0	1	0	1
8WC	WASHINGTON COUNTY AIRPORT	MO	LPV	0	1	0	1	0	1
AIZ	LEE C FINE MEMORIAL	MO	LPV	0	1	0	1	0	1
BBG	BRANSON	MO	LPV200	0	1	0	1	0	1
CGI	CAPE GIRARDEAU RGNL	MO	LPV	0	1	0	1	0	1
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	1	0	1	0	1
COU	COLUMBIA REGIONAL	MO	LPV	0	1	0	1	0	1
DMO	SEDALIA MEMORIAL	MO	LPV	0	1	0	1	0	1
DXE	DEXTER MUNICIPAL	MO	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
EIW	COUNTY MEMORIAL	MO	LPV	0	1	0	1	0	1
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	1	0	1	0	1
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	1	0	1	0	1
EZZ	CAMERON MEMORIAL	MO	LPV	0	1	0	1	0	1
FAM	FARMINGTON REGIONAL	MO	LPV	0	1	0	1	0	1
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	0	1	0	1	0	1
FWB	BRANSON WEST MUNICIPAL-EMERSON FIELD	MO	LP	0	1	0	1	0	1
FYG	WASHINGTON RGNL	MO	LPV	0	1	0	1	0	1
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	1	0	1	0	1
H21	CAMDENTON MEMORIAL	MO	LPV	0	1	0	1	0	1
HAE	HANNIBAL RGNL	MO	LPV	0	1	0	1	0	1
HFJ	MONETT MUNICIPAL	MO	LPV	0	1	0	1	0	1
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	0	1	0	1	0	1
IRK	KIRKSVILLE RGNL	MO	LPV200	0	1	0	1	0	1
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	0	1	0	1	0	1
JLN	JOPLIN REGIONAL	MO	LPV	0	1	0	1	0	1
K02	PERRYVILLE MUNICIPAL	MO	LPV	0	1	0	1	0	1
K57	GOULD PETERSON MUNICIPAL	MO	LPV	0	1	0	1	0	1
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	0	1	0	1	0	1
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	0	1	0	1	0	1
M05	CARUTHERSVILLE MEM	MO	LPV	0	1	0	1	0	1
M17	BOLIVAR MUNICIPAL	MO	LPV	0	1	0	1	0	1
MAW	MALDEN MUNICIPAL	MO	LPV	0	1	0	1	0	1
MBY	OMAR N BRADLEY	MO	LPV	0	1	0	1	0	1
MCI	KANSAS CITY INTL	MO	LPV	0	1	0	1	0	1
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	0	1	0	1	0	1
MKC	CHARLES B. WHEELER DOWNTOWN	MO	LPV200	0	1	0	1	0	1
MO8	NORTH CENTRAL MISSOURI REGIONAL	MO	LPV	0	1	0	1	0	1
MYJ	MEXICO MEMORIAL	MO	LPV	0	1	0	1	0	1
NVD	NEVADA MUNICIPALCIPAL	MO	LPV200	0	1	0	1	0	1
PLK	M. GRAHAM CLARK-TANEY COUNTY	MO	LPV200	0	1	0	1	0	1
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	0	1	0	1	0	1
RCM	SKYHAVEN	MO	LPV	0	1	0	1	0	1
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV	0	1	0	1	0	1
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	0	1	0	1	0	1
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	1	0	1	0	1
STL	LAMBERT-ST LOUIS INTL	MO	LPV200	0	1	0	1	0	1
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	1	0	1	0	1
TBN	WAYNESVILLE-ST ROBERT RGNL/FORNEY AAF	MO	LPV	0	1	0	1	0	1
UBX	CUBA MUNICIPAL	MO	LPV	0	1	0	1	0	1
UNO	WEST PLAINS MUNICIPAL	MO	LPV	0	1	0	1	0	1
UUV	SULLIVAN REGIONAL	MO	LPV	0	1	0	1	0	1
VER	JESSE VIERTEL MEMORIAL	MO	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
VIH	ROLLA NATIONAL	MO	LPV200	0	1	0	1	0	1
CKM	FLETCHER FIELD	MS	LPV	0	1	0	1	0	1
CRX	ROSCOE TURNER	MS	LPV200	0	1	0	1	0	1
GLH	MID DELTA REGIONAL	MS	LPV200	0	1	0	1	0	1
GNF	GRENADA MUNICIPAL	MS	LPV	0	1	0	1	0	1
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	1	0	1	0	1
GTR	GOLDEN TRIANGLE RGNL	MS	LPV	0	1	0	1	0	1
GWO	GREENWOOD-LEFLORE	MS	LPV	0	1	0	1	0	1
HBG	HATTIESBURG BOBBY L. CHAIN MUNICIPAL	MS	LPV200	0	1	0	1	0	1
HEZ	HARDY-ANDERS FLD NATCHEZ-ADAMS COUNTY	MS	LPV	0	1	0	1	0	1
HKS	HAWKINS FIELD	MS	LPV200	0	1	0	1	0	1
HSA	STENNIS INTL	MS	LPV200	0	1	0	1	0	1
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	1	0	1	0	1
JAN	JACKSON-EVERS INTL	MS	LPV200	0	1	0	1	0	1
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	1	0	1	0	1
LUL	HESLER-NOBLE FIELD	MS	LPV	0	1	0	1	0	1
M40	MONROE COUNTY	MS	LPV	0	1	0	1	0	1
M43	PRENTISS-JEFFERSON DAVIS COUNTY	MS	LPV	0	1	0	1	0	1
MCB	MC COMB-PIKE COUNTY-JOHN E LEWIS FIELD	MS	LPV	0	1	0	1	0	1
MEI	KEY FIELD	MS	LPV200	0	1	0	1	0	1
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	1	0	1	0	1
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	1	0	1	0	1
OLV	OLIVE BRANCH	MS	LPV	0	1	0	1	0	1
PIB	HATTIESBURG-LAUREL REGIONAL	MS	LPV200	0	1	0	1	0	1
PQL	TRENT LOTT INTL	MS	LPV200	0	1	0	1	0	1
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	1	0	1	0	1
STF	GEORGE M BRYAN	MS	LPV200	0	1	0	1	0	1
TUP	TUPELO REGIONAL	MS	LPV200	0	1	0	1	0	1
UOX	UNIVERSITY-OXFORD	MS	LPV	0	1	0	1	0	1
UTA	TUNICA MUNICIPAL	MS	LPV200	0	1	0	1	0	1
1S3	TILLITT FIELD	MT	LPV	0	1	0	1	0	1
6S8	LAUREL MUNICIPALCIPAL	MT	LPV	0	1	0	1	0	1
7S0	RONAN	MT	LPV	0	1	0	1	0	1
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	1	0	1	0	1
BTM	BERT MOONEY	MT	LPV	0	1	0	1	0	1
BZN	GALLATIN FIELD	MT	LPV	0	1	0	1	0	1
GDV	DAWSON COMMUNICIPALTY	MT	LPV	0	1	0	1	0	1
GGW	WOKAL FIELD/GLASGOW INTL	MT	LPV200	0	1	0	1	0	1
GPI	GLACIER PARK INTL	MT	LPV	0	1	0	1	0	1
GTF	GREAT FALLS INTL	MT	LPV200	0	1	0	1	0	1
HLN	HELENA REGIONAL	MT	LPV	0	1	0	1	0	1
HVR	HAVRE CITY-COUNTY	MT	LPV	0	1	0	1	0	1
LVM	MISSION FIELD	MT	LP	0	1	0	1	0	1
LWT	LEWISTOWN MUNICIPAL	MT	LPV	0	1	0	1	0	1
M75	MALTA	MT	LP	0	1	0	1	0	1
MLS	FRANK WILEY FIELD	MT	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
MSO	MISSOULA INTL	MT	LPV	0	1	0	1	0	1
SBX	SHELBY	MT	LP	0	1	0	1	0	1
SDY	SIDNEY-RICHLAND MUNICIPAL	MT	LPV	0	1	0	1	0	1
WYS	YELLOWSTONE	MT	LPV200	0	1	0	1	0	1
CYCL	CHARLO	NB	LPV	1	0.999626	1	0.999595	2	0.999090
CYQM	MONCTON INTL	NB	LPV	1	0.999877	1	0.999877	2	0.999140
AFP	ANSON COUNTY-JEFF CLOUD FLD	NC	LPV	0	1	0	1	0	1
AKH	GASTONIA MUNICIPAL	NC	LPV	0	1	0	1	0	1
AVL	ASHEVILLE REGIONAL	NC	LPV	0	1	0	1	0	1
BUY	BURLINGTON-ALAMANCE REGIONAL	NC	LPV200	0	1	0	1	0	1
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	1	0	1	0	1
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	1	0	1	0	1
DPL	DUPLIN COUNTY	NC	LPV200	0	1	0	1	0	1
ECG	ELIZABETH CITY CG AIR STATION/REGIONAL	NC	LPV	0	1	0	1	0	1
EDE	NORTHEASTERN RGNL	NC	LPV200	0	1	0	1	0	1
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	0	1	0	1	0	1
EQY	MONROE REGIONAL	NC	LPV	0	1	0	1	0	1
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	0	1	0	1	0	1
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	0	1	0	1	0	1
FAY	FAYETTEVILLE REGIONAL/GRANNIS FIELD	NC	LPV200	0	1	0	1	0	1
FQD	RUTHERFORD CO/MARCHMAN FIELD	NC	LPV	0	1	0	1	0	1
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	1	0	1	0	1
GWW	GOLDSBORO-WAYNE MUNICIPAL	NC	LPV200	0	1	0	1	0	1
HKY	HICKORY REGIONAL	NC	LPV200	0	1	0	1	0	1
HNZ	HENDERSON-OXFORD	NC	LPV	0	1	0	1	0	1
HRJ	HARNETT COUNTY	NC	LPV	0	1	0	1	0	1
ILM	WILMINGTON INTL	NC	LPV200	0	1	0	1	0	1
INT	SMITH REYNOLDS	NC	LPV200	0	1	0	1	0	1
IPJ	LINCOLNTON-LINCOLN COUNTY REGIONAL	NC	LPV	0	1	0	1	0	1
ISO	KINSTON REGL JETPORT AT STALLINGS FLD	NC	LPV	0	1	0	1	0	1
IXA	HALIFAX-NORTHAMPTON REGIONAL	NC	LPV200	0	1	0	1	0	1
JNX	JOHNSTON COUNTY	NC	LPV200	0	1	0	1	0	1
JQF	CONCORD RGNL	NC	LPV	0	1	0	1	0	1
LBT	LUMBERTON MUNICIPAL	NC	LPV	0	1	0	1	0	1
LHZ	FRANKLIN COUNTY	NC	LPV200	0	1	0	1	0	1
MEB	LAURINBURG-MAXTON	NC	LPV200	0	1	0	1	0	1
MQI	DARE COUNTY REGIONAL	NC	LPV	0	1	0	1	0	1
MRH	MICHAEL J. SMITH FIELD	NC	LPV	0	1	0	1	0	1
MRN	FOOTHILLS REGIONAL	NC	LPV200	0	1	0	1	0	1
MWK	MOUNT AIRY/SURRY COUNTY	NC	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
OAJ	ALBERT J ELLIS	NC	LPV200	0	1	0	1	0	1
OCW	WARREN FIELD	NC	LPV	0	1	0	1	0	1
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	1	0	1	0	1
PGV	PITT-GREENVILLE	NC	LPV	0	1	0	1	0	1
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	1	0	1	0	1
RCZ	RICHMOND COUNTY	NC	LPV	0	1	0	1	0	1
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	1	0	1	0	1
RUQ	ROWAN COUNTY	NC	LPV200	0	1	0	1	0	1
RWI	ROCKY MOUNT-WILSON REGIONAL	NC	LPV	0	1	0	1	0	1
SOP	MOORE COUNTY	NC	LPV	0	1	0	1	0	1
SUT	CAPE FEAR RGNL JETPORT/HOWIE FRANKLIN FLD	NC	LPV	0	1	0	1	0	1
SVH	STATESVILLE REGIONAL	NC	LPV	0	1	0	1	0	1
TDF	PERSON COUNTY	NC	LPV200	0	1	0	1	0	1
TTA	SANFORD-LEE COUNTY REGIONAL	NC	LPV200	0	1	0	1	0	1
VUJ	STANLY COUNTY	NC	LPV200	0	1	0	1	0	1
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	1	0	1	0	1
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	1	0	1	0	1
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	1	0	1	0	1
D09	BOTTINEAU MUNICIPAL	ND	LPV	0	1	0	1	0	1
D55	ROBERTSON FIELD	ND	LPV	0	1	0	1	0	1
DIK	DICKINSON-THEODORE ROOSEVELT REGIONAL	ND	LPV200	0	1	0	1	0	1
DVL	DEVILS LAKE RGNL	ND	LPV	0	1	0	1	0	1
FAR	HECTOR INTL	ND	LPV200	0	1	0	1	0	1
GAF	HUTSON FIELD	ND	LPV	0	1	0	1	0	1
GFK	GRAND FORKS INTL	ND	LPV	0	1	0	1	0	1
GWR	GWINNER-ROGER MELROE FIELD	ND	LPV200	0	1	0	1	0	1
HZE	MERCER COUNTY REGIONAL	ND	LPV	0	1	0	1	0	1
ISN	SLOULIN FLD INTL	ND	LPV200	0	1	0	1	0	1
JMS	JAMESTOWN REGIONAL	ND	LPV200	0	1	0	1	0	1
MOT	MINOT INTL	ND	LPV	0	1	0	1	0	1
RUG	RUGBY MUNICIPAL	ND	LP	0	1	0	1	0	1
S25	WATFORD CITY MUNICIPAL	ND	LPV	0	1	0	1	0	1
07K	CENTRAL CITY MUNICIPAL-LARRY REINEKE FIELD	NE	LPV	0	1	0	1	0	1
0B4	HARTINGTON MUNICIPAL	NE	LPV	0	1	0	1	0	1
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	1	0	1	0	1
12K	SUPERIOR MUNICIPAL	NE	LPV	0	1	0	1	0	1
4V9	ANTELOPE COUNTY	NE	LPV	0	1	0	1	0	1
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	1	0	1	0	1
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	0	1	0	1	0	1
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	1	0	1	0	1
9V5	MODISETT	NE	LPV	0	1	0	1	1	0.999985
AFK	NEBRASKA CITY MUNICIPAL	NE	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
AHQ	WAHOO MUNICIPAL	NE	LPV	0	1	0	1	0	1
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	1	0	1	1	0.999934
ANW	AINSWORTH MUNICIPAL	NE	LPV200	0	1	0	1	0	1
AUH	AURORA MUNICIPALCIPAL - AL POTTER FIELD	NE	LPV	0	1	0	1	0	1
BBW	BROKEN BOW MUNICIPAL	NE	LPV	0	1	0	1	0	1
BFF	WESTERN NEB. RGNL/WILLIAM B. HEILIG FIELD	NE	LPV	0	1	0	1	1	0.999927
BIE	BEATRICE MUNICIPAL	NE	LPV200	0	1	0	1	0	1
BVN	ALBION MUNICIPAL	NE	LPV	0	1	0	1	0	1
CDR	CHADRON MUNICIPAL	NE	LPV200	0	1	0	1	1	0.999996
CEK	CRETE MUNICIPALCIPAL	NE	LPV	0	1	0	1	0	1
CZD	COZAD MUNICIPAL	NE	LPV	0	1	0	1	0	1
EAR	KEARNEY RGNL	NE	LPV	0	1	0	1	0	1
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	1	0	1	0	1
FET	FREMONT MUNICIPAL	NE	LPV	0	1	0	1	0	1
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	1	0	1	0	1
FNB	BRENNER FIELD	NE	LPV	0	1	0	1	0	1
GGF	GRANT MUNICIPAL	NE	LPV	0	1	0	1	1	0.999919
GRI	CENTRAL NEBRASKA REGIONAL	NE	LPV	0	1	0	1	0	1
GRN	GORDON MUNICIPAL	NE	LPV	0	1	0	1	0	1
HDE	BREWSTER FIELD	NE	LPV	0	1	0	1	0	1
HSI	HASTINGS MUNICIPAL	NE	LPV	0	1	0	1	0	1
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	0	1	0	1	1	0.999880
IML	IMPERIAL MUNICIPAL	NE	LPV	0	1	0	1	1	0.999880
JYR	YORK MUNICIPALCIPAL	NE	LPV	0	1	0	1	0	1
LBF	NORTH PLATTE RGNL AIRPORT LEE BIRD FIELD	NE	LPV	0	1	0	1	0	1
LCG	WAYNE MUNICIPAL	NE	LPV	0	1	0	1	0	1
LNK	LINCOLN	NE	LPV	0	1	0	1	0	1
LXN	JIM KELLY FIELD	NE	LPV	0	1	0	1	0	1
MCK	MCCOOK REGIONAL	NE	LPV	0	1	0	1	1	0.999973
MLE	MILLARD	NE	LPV	0	1	0	1	0	1
ODX	EVELYN SHARP FIELD	NE	LPV	0	1	0	1	0	1
OFK	KARL STEFAN MEMORIAL	NE	LPV	0	1	0	1	0	1
OGA	SEARLE FIELD	NE	LPV	0	1	0	1	1	0.999946
OKS	GARDEN COUNTY	NE	LPV	0	1	0	1	1	0.999915
OLU	COLUMBUS MUNICIPAL	NE	LPV	0	1	0	1	0	1
OMA	EPPLEY AIRFIELD	NE	LPV	0	1	0	1	0	1
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER FIELD	NE	LPV	0	1	0	1	0	1
PMV	PLATTSMOUTH MUNICIPAL	NE	LPV	0	1	0	1	0	1
RBE	ROCK COUNTY	NE	LPV	0	1	0	1	0	1
SNY	SIDNEY MUNICIPAL/LLOYD W. CARR FIELD	NE	LPV	0	1	0	1	1	0.999873
SWT	SEWARD MUNICIPALCIPAL	NE	LPV	0	1	0	1	0	1
TIF	THOMAS COUNTY	NE	LPV	0	1	0	1	0	1
VTN	MILLER FIELD	NE	LPV	0	1	0	1	0	1
CON	CONCORD MUNICIPAL	NH	LPV	0	1	0	1	1	0.999931

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
DAW	SKYHAVEN	NH	LPV	0	1	0	1	1	0.999923
EEN	DILLANT-HOPKINS	NH	LPV	0	1	0	1	1	0.999950
HIE	MOUNT WASHINGTON REGIONAL	NH	LPV	0	1	0	1	1	0.999915
LCI	LACONIA MUNICIPAL	NH	LPV	0	1	0	1	1	0.999923
LEB	LEBANON MUNICIPAL	NH	LPV	0	1	0	1	1	0.999938
MHT	MANCHESTER	NH	LPV200	0	1	0	1	1	0.999934
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	1	0	1	1	0.999923
39N	PRINCETON	NJ	LPV	0	1	0	1	0	1
47N	CENTRAL JERSEY REGIONAL	NJ	LP	0	1	0	1	0	1
4N1	GREENWOOD LAKE	NJ	LP	0	1	0	1	0	1
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	1	0	1	0	1
CDW	ESSEX COUNTY	NJ	LPV	0	1	0	1	0	1
EWR	NEWARK LIBERTY INTL	NJ	LPV	0	1	0	1	0	1
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	1	0	1	0	1
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	0	1	0	1	0	1
N40	SKY MANOR	NJ	LP	0	1	0	1	0	1
TEB	TETERBORO	NJ	LPV	0	1	0	1	0	1
VAY	SOUTH JERSEY REGIONAL	NJ	LP	0	1	0	1	0	1
WWD	CAPE MAY COUNTY	NJ	LPV	0	1	0	1	0	1
CYDF	DEER LAKE	NL	LPV	1	0.999186	2	0.998924	19	0.997249
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV	0	1	0	1	0	1
CNM	CAVERN CITY AIR TRML	NM	LP	0	1	0	1	0	1
CVN	CLOVIS MUNICIPAL	NM	LPV	0	1	0	1	0	1
DMN	DEMING MUNICIPAL	NM	LPV	0	1	0	1	0	1
FMN	FOUR CORNERS RGNL	NM	LPV200	0	1	0	1	0	1
HOB	LEA COUNTY REGIONAL	NM	LPV200	0	1	0	1	0	1
LAM	LOS ALAMOS	NM	LP	0	1	0	1	0	1
ONM	SOCORRO MUNICIPAL	NM	LP	0	1	0	1	0	1
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	1	0	1	0	1
SRR	SIERRA BLANCA REGIONAL	NM	LPV200	0	1	0	1	0	1
SVC	GRANT COUNTY	NM	LPV	0	1	0	1	1	0.999985
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	1	0.999907	2	0.999823	2	0.999240
CYEV	INUVIK	NT	LPV	0	1	0	1	6	0.999799
ELY	ELY ARPT-YELLAND FLD	NV	LPV	0	1	0	1	0	1
LAS	MC CARRAN INTL	NV	LPV	0	1	0	1	0	1
RNO	RENO/TAHOE INTL	NV	LPV	0	1	0	1	1	0.999985
RTS	RENO/STEAD	NV	LPV	0	1	1	0.999996	2	0.999981
TPH	TONOPAH	NV	LP	0	1	0	1	1	0.999981
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	1	0	1	0	1
1B1	COLUMBIA COUNTY	NY	LPV	0	1	0	1	1	0.999985
44N	SKY ACRES	NY	LPV	0	1	0	1	1	0.999996
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	1	0	1	1	0.999954
5B2	SARATOGA COUNTY	NY	LPV	0	1	0	1	1	0.999977
7G0	LEDGEDALE AIRPARK	NY	LPV	0	1	0	1	0	1
9G0	BUFFALO AIRFIELD	NY	LP	0	1	0	1	0	1
ALB	ALBANY INTL	NY	LPV200	0	1	0	1	1	0.999981
ART	WATERTOWN INTL	NY	LPV200	0	1	0	1	1	0.999996
BGM	GREATER BINGHAMTON/EDWIN A LINK FIELD	NY	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
BUF	BUFFALO NIAGARA INTL	NY	LPV	0	1	0	1	0	1
D38	CANANDAIGUA	NY	LP	0	1	0	1	0	1
ELM	ELMIRA/CORNING REGIONAL	NY	LPV200	0	1	0	1	0	1
ELZ	WELLSVILLE MUNICIPAL ARPT	NY	LPV	0	1	0	1	0	1
FOK	FRANCIS S. GABRESKI	NY	LPV200	0	1	0	1	1	0.999988
FRG	REPUBLIC	NY	LPV200	0	1	0	1	0	1
FZY	OSWEGO COUNTY	NY	LPV	0	1	0	1	0	1
GFL	FLOYD BENNETT MEMORIAL	NY	LPV	0	1	0	1	1	0.999969
GVQ	BATAVIA	NY	LPV200	0	1	0	1	0	1
HPN	WESTCHESTER COUNTY	NY	LPV	0	1	0	1	0	1
HTF	HORNELL MUNICIPAL	NY	LPV	0	1	0	1	0	1
HTO	EAST HAMPTON	NY	LPV	0	1	0	1	1	0.999977
HWV	BROOKHAVEN	NY	LPV	0	1	0	1	1	0.999996
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	1	0	1	1	0.999996
ITH	ITHACA TOMPKINS RGNL	NY	LPV	0	1	0	1	0	1
JFK	JOHN F KENNEDY INTL	NY	LPV	0	1	0	1	0	1
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	1	0	1	0	1
LGA	LA GUARDIA	NY	LPV200	0	1	0	1	0	1
MGJ	ORANGE COUNTY	NY	LPV	0	1	0	1	0	1
MSS	MASSENA INTL-RICHARDS FIELD	NY	LPV	0	1	0	1	1	0.999965
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	1	0	1	0	1
N66	ONEONTA MUNICIPAL	NY	LPV	0	1	0	1	0	1
NY0	FULTON COUNTY	NY	LPV	0	1	0	1	1	0.999985
OGS	OGDENSBURG INTL	NY	LPV	0	1	0	1	1	0.999973
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	0	1	0	1	0	1
PBG	PLATTSBURGH INTL	NY	LPV	0	1	0	1	1	0.999942
PEO	PENN YAN	NY	LPV	0	1	0	1	0	1
POU	DUTCHESS COUNTY	NY	LPV	0	1	0	1	1	0.999996
RME	GRIFFISS INTL	NY	LPV200	0	1	0	1	1	0.999996
ROC	GREATER ROCHESTER INTL	NY	LPV200	0	1	0	1	0	1
SCH	SCHENECTADY COUNTY	NY	LPV200	0	1	0	1	1	0.999981
SDC	WILLIAMSON-SODUS	NY	LPV	0	1	0	1	0	1
SWF	STEWART INTL	NY	LPV200	0	1	0	1	0	1
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	1	0	1	0	1
VGC	HAMILTON MUNICIPAL	NY	LPV	0	1	0	1	0	1
0G6	WILLIAMS COUNTY	OH	LPV	0	1	0	1	0	1
16G	SENECA COUNTY	OH	LPV	0	1	0	1	0	1
1G0	WOOD COUNTY	OH	LPV	0	1	0	1	0	1
1G3	KENT STATE UNIV	OH	LPV	0	1	0	1	0	1
4I3	KNOX COUNTY	OH	LPV200	0	1	0	1	0	1
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	1	0	1	0	1
AOH	LIMA ALLEN COUNTY	OH	LPV	0	1	0	1	0	1
AXV	NEIL ARMSTRONG	OH	LPV	0	1	0	1	0	1
BJJ	WAYNE COUNTY	OH	LPV	0	1	0	1	0	1
BKL	BROOKHAVEN	OH	LPV	0	1	0	1	0	1
CAK	AKRON-CANTON RGNL	OH	LPV200	0	1	0	1	0	1
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	1	0	1	0	1
CMH	PORT COLUMBUS INTL	OH	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
CQA	LAKEFIELD	OH	LPV	0	1	0	1	0	1
CXY	CAPITAL CITY	OH	LPV	0	1	0	1	0	1
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	1	0	1	0	1
DLZ	DELAWARE MUNICIPAL	OH	LPV	0	1	0	1	0	1
EDJ	BELLEFONTAINE REGIONAL	OH	LPV	0	1	0	1	0	1
FDY	FINDLAY	OH	LPV	0	1	0	1	0	1
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	1	0	1	0	1
GQQ	GALION MUNICIPAL	OH	LP	0	1	0	1	0	1
HAO	BUTLER CO RGNL	OH	LPV	0	1	0	1	0	1
HZY	ASHTABULA COUNTY	OH	LPV	0	1	0	1	0	1
I19	GREENE COUNTY-LEWIS A JACKSON REGIONAL	OH	LPV	0	1	0	1	0	1
I66	CLINTON FIELD	OH	LPV	0	1	0	1	0	1
I69	CLERMONT COUNTY	OH	LP	0	1	0	1	0	1
I74	GRIMES FIELD	OH	LPV	0	1	0	1	0	1
ILN	AIRBORNE AIRPARK	OH	LPV200	0	1	0	1	0	1
LCK	RICKENBACKER INTL	OH	LPV200	0	1	0	1	0	1
LHQ	FAIRFIELD COUNTY	OH	LPV	0	1	0	1	0	1
LNN	WILLOUGHBY	OH	LPV	0	1	0	1	0	1
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	1	0	1	0	1
LUK	CINCINNATI MUNICIPAL AIRPORT-LUNKEN FIELD	OH	LPV	0	1	0	1	0	1
MFD	MANSFIELD LAHM REGIONAL	OH	LPV200	0	1	0	1	0	1
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	1	0	1	0	1
MNN	MARION MUNICIPAL	OH	LPV	0	1	0	1	0	1
MRT	UNION COUNTY	OH	LP	0	1	0	1	0	1
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	1	0	1	0	1
OWX	PUTNAM COUNTY	OH	LPV	0	1	0	1	0	1
OXD	MIAMI UNIVERSITY	OH	LPV	0	1	0	1	0	1
PCW	CARL R KELLER FIELD	OH	LPV	0	1	0	1	0	1
PHD	HARRY CLEVER FIELD	OH	LP	0	1	0	1	0	1
PMH	GREATER PORTSMOUTH REGIONAL	OH	LPV	0	1	0	1	0	1
RZT	ROSS COUNTY	OH	LPV	0	1	0	1	0	1
S24	SANDUSKY COUNTY REGIONAL	OH	LPV	0	1	0	1	0	1
SGH	SPRINGFIELD-BECKLEY MUNICIPAL	OH	LPV200	0	1	0	1	0	1
TDZ	TOLEDO EXECUTIVE	OH	LP	0	1	0	1	0	1
TOL	TOLEDO EXPRESS	OH	LPV200	0	1	0	1	0	1
TZR	BOLTON FIELD	OH	LPV200	0	1	0	1	0	1
UNI	OHIO UNIVERSITY SNYDER FIELD	OH	LPV200	0	1	0	1	0	1
USE	FULTON COUNTY	OH	LPV	0	1	0	1	0	1
UYF	MADISON COUNTY	OH	LPV	0	1	0	1	0	1
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	0	1	0	1	0	1
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	1	0	1	0	1
ADH	ADA MUNICIPAL	OK	LPV	0	1	0	1	0	1
ADM	ARDMORE MUNICIPAL	OK	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
AXS	ALTUS/QUARTZ MOUNTAIN REGIONAL	OK	LPV	0	1	0	1	0	1
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	0	1	0	1	0	1
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	1	0	1	0	1
CLK	CLINTON REGIONAL	OK	LPV200	0	1	0	1	0	1
CSM	CLINTON-SHERMAN	OK	LPV200	0	1	0	1	0	1
DUA	EAKER FIELD	OK	LPV	0	1	0	1	0	1
DUC	HALLIBURTON FIELD	OK	LPV	0	1	0	1	0	1
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	1	0	1	0	1
F22	PERRY MUNICIPAL	OK	LPV	0	1	0	1	0	1
FDR	FREDERICK REGIONAL	OK	LPV200	0	1	0	1	0	1
GCM	CLAREMORE RGNL	OK	LPV	0	1	0	1	0	1
GMJ	GROVE MUNICIPAL	OK	LPV	0	1	0	1	0	1
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	1	0	1	0	1
GUY	GUYMON MUNICIPAL	OK	LPV	0	1	0	1	0	1
GZL	STIGLER REGIONAL	OK	LPV	0	1	0	1	0	1
HBR	HOBART MUNICIPAL	OK	LPV	0	1	0	1	0	1
HSD	SUNDANCE AIRPARK	OK	LPV	0	1	0	1	0	1
MKO	DAVIS FIELD	OK	LPV	0	1	0	1	0	1
MLC	MC ALESTER REGIONAL	OK	LPV	0	1	0	1	0	1
OKC	WILL ROGERS WORLD	OK	LPV200	0	1	0	1	0	1
OKM	OKMULGEE REGIONAL	OK	LPV	0	1	0	1	0	1
OUN	UNIVERSITY OF OKLAHOMA WESTHEIMER	OK	LPV200	0	1	0	1	0	1
OWP	WILLIAM R. POGUE MUNICIPAL	OK	LPV	0	1	0	1	0	1
PNC	PONCA CITY REGIONAL	OK	LPV	0	1	0	1	0	1
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	1	0	1	0	1
PWA	WILEY POST	OK	LPV200	0	1	0	1	0	1
RCE	CLARENCE E. PAGE MUNICIPAL	OK	LPV	0	1	0	1	0	1
RVS	RICHARD LLOYD JONES JR	OK	LPV	0	1	0	1	0	1
SNL	SHAWNEE REGIONAL	OK	LPV200	0	1	0	1	0	1
SWO	STILLWATER REGIONAL	OK	LPV	0	1	0	1	0	1
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	1	0	1	0	1
TUL	TULSA INTL	OK	LPV200	0	1	0	1	0	1
WDG	ENID WOODRING REGIONAL	OK	LPV200	0	1	0	1	0	1
WWR	WEST WOODWARD	OK	LPV	0	1	0	1	0	1
CNS7	KINCARDINE	ON	LPV	0	1	0	1	1	0.999996
CYHD	DRYDEN REGIONAL	ON	LPV	0	1	0	1	1	0.999965
CYKF	KITCHENER / WATERLOO	ON	LPV	0	1	0	1	0	1
CYOW	OTTAWA / MACDONALDCARTIER INTL	ON	LPV	0	1	0	1	1	0.999969
CYQT	THUNDER BAY	ON	LPV	0	1	0	1	1	0.999977
CYTS	TIMMINS / VICTOR M POWER	ON	LPV	0	1	1	0.999988	1	0.999954
CYXL	SIOUX LOOKOUT	ON	LPV	0	1	0	1	1	0.999950
AST	ASTORIA REGIONAL	OR	LPV	0	1	1	0.999830	24	0.999352
BDN	BEND MUNICIPAL	OR	LPV	0	1	0	1	2	0.999931
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	1	1	0.999850	59	0.998256
EUG	MAHLON SWEET FIELD	OR	LPV200	0	1	1	0.999853	63	0.998040

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	0	1	0	1	0	1
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	1	1	0.999865	25	0.999525
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	1	0	1	0	1
LMT	KLAMATH FALLS	OR	LPV	0	1	0	1	4	0.999730
MMV	MCMINNVILLE MUNICIPAL	OR	LPV	0	1	1	0.999857	32	0.999225
ONO	ONTARIO MUNICIPAL	OR	LPV	0	1	0	1	0	1
PDT	EASTERN OREGON RGNL AT PENDLETON	OR	LPV200	0	1	0	1	0	1
PDX	PORTLAND INTL	OR	LPV200	0	1	1	0.999880	7	0.999707
RDM	ROBERTS FIELD	OR	LPV200	0	1	0	1	2	0.999931
S33	MADRAS MUNICIPALCIPAL	OR	LPV	0	1	0	1	1	0.999938
SLE	MCNARY FLD	OR	LPV200	0	1	1	0.999861	33	0.999221
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	1	1	0.999865	10	0.999653
UAO	AURORA STATE	OR	LPV	0	1	1	0.999869	24	0.999525
22N	JAKE ARNER MEMORIAL	PA	LP	0	1	0	1	0	1
2G9	SOMERSET COUNTY	PA	LPV	0	1	0	1	0	1
8G2	CORRY-LAWRENCE	PA	LPV	0	1	0	1	0	1
8N8	DANVILLE	PA	LP	0	1	0	1	0	1
9D4	DECK	PA	LPV	0	1	0	1	0	1
ABE	LEHIGH VALLEY INTL	PA	LPV	0	1	0	1	0	1
AFJ	WASHINGTON COUNTY	PA	LPV	0	1	0	1	0	1
AGC	ALLEGHENY COUNTY	PA	LPV	0	1	0	1	0	1
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	1	0	1	0	1
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV	0	1	0	1	0	1
AXQ	CLARION COUNTY	PA	LPV	0	1	0	1	0	1
BFD	BRADFORD REGIONAL	PA	LPV200	0	1	0	1	0	1
BTP	BUTLER COUNTY/K W SCHOLTER FLD	PA	LPV	0	1	0	1	0	1
BVI	BEAVER FALLS MUNICIPAL	PA	LPV	0	1	0	1	0	1
DUJ	DUBOIS RGNL	PA	LPV200	0	1	0	1	0	1
ERI	ERIE INTL/TOM RIDGE FLD	PA	LPV	0	1	0	1	0	1
FKL	VENANGO REGIONAL	PA	LPV	0	1	0	1	0	1
FWQ	ROSTRAVER	PA	LPV	0	1	0	1	0	1
GKJ	PORT MEADVILLE	PA	LP	0	1	0	1	0	1
HMZ	BEDFORD COUNTY	PA	LPV	0	1	0	1	0	1
HZL	HAZLETON MUNICIPAL	PA	LPV	0	1	0	1	0	1
IPT	WILLIAMSPORT RGNL	PA	LPV	0	1	0	1	0	1
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA COUNTY	PA	LPV200	0	1	0	1	0	1
LBE	ARNOLD PALMER RGNL	PA	LPV	0	1	0	1	0	1
LNS	LANCASTER	PA	LPV	0	1	0	1	0	1
LOM	WINGS FIELD	PA	LPV	0	1	0	1	0	1
MDT	HARRISBURG INTL	PA	LPV	0	1	0	1	0	1
MPO	POCONO MOUNTAINS MUNICIPAL	PA	LPV	0	1	0	1	0	1
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	1	0	1	0	1
N79	NORTHUMBERLAND COUNTY	PA	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
OYM	ST MARYS MUNICIPAL	PA	LPV	0	1	0	1	0	1
PHL	PHILADELPHIA INTL	PA	LPV	0	1	0	1	0	1
PIT	PITTSBURGH INTL	PA	LPV200	0	1	0	1	0	1
PNE	NORTHEAST PHILADELPHIA	PA	LPV	0	1	0	1	0	1
PSB	MID STATE	PA	LPV	0	1	0	1	0	1
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	0	1	0	1	0	1
RVL	MIFFLIN COUNTY	PA	LPV	0	1	0	1	0	1
THV	YORK	PA	LP	0	1	0	1	0	1
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	1	0	1	0	1
UKT	QUAKERTOWN	PA	LP	0	1	0	1	0	1
UNV	UNIVERSITY PARK	PA	LPV200	0	1	0	1	0	1
WAY	GREENE COUNTY	PA	LPV	0	1	0	1	0	1
XLL	ALLENTOWN-QUEEN CITY MUNICIPAL	PA	LP	0	1	0	1	0	1
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	0	1	0	1	0	1
CPN8	OPINACA	QC	LPV	1	0.999630	2	0.999421	4	0.998873
CSR3	VICTORIAVILLE	QC	LPV	0	1	0	1	2	0.999641
CTP9	KATTINIQ / DONALDSON	QC	LPV	1	0.999074	5	0.998792	59	0.993704
CYEY	AMOS	QC	LPV	0	1	1	0.999996	3	0.999753
CYHU	MONTREAL / STHUBERT	QC	LPV	0	1	0	1	1	0.999931
CYIF	STAUGUSTIN	QC	LPV	1	0.999259	2	0.998966	8	0.998048
CYMX	MONTREAL (MIRABEL INTL)	QC	LPV	0	1	0	1	1	0.999934
CYQB	QUEBEC / JEAN LESAGE INTL	QC	LPV	0	1	0	1	2	0.999286
CYRI	RIVIEREDULOUP	QC	LPV	1	0.999834	2	0.999799	2	0.999236
CYRQ	TROISRIVIERES	QC	LPV	0	1	0	1	2	0.999649
CYVB	BONAVENTURE	QC	LPV	1	0.999606	1	0.999595	2	0.999074
CYVP	KUUJJUAQ	QC	LPV	1	0.999105	4	0.998897	22	0.996400
CYYY	MONTJOLI	QC	LPV	1	0.999595	1	0.999595	2	0.999113
BID	BLOCK ISLAND STATE	RI	LPV	0	1	0	1	1	0.999961
OQU	QUONSET STATE	RI	LPV	0	1	0	1	1	0.999954
PVD	THEODORE FRANCIS GREEN STATE	RI	LPV200	0	1	0	1	1	0.999954
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	0	1	0	1	0	1
AIK	AIKEN MUNICIPAL	SC	LPV200	0	1	0	1	0	1
AND	ANDERSON RGNL	SC	LPV200	0	1	0	1	0	1
ARW	BEAUFORT CO	SC	LPV200	0	1	0	1	0	1
BBP	MARLBORO COUNTY JETPORT-H E AVENT FIELD	SC	LPV	0	1	0	1	0	1
BNL	BARNWELL RGNL	SC	LPV	0	1	0	1	0	1
CAE	COLUMBIA METROPOLITAN	SC	LPV200	0	1	0	1	0	1
CDN	WOODWARD FIELD	SC	LPV	0	1	0	1	0	1
CEU	OCONEE COUNTY RGNL	SC	LPV	0	1	0	1	0	1
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	1	0	1	0	1
CRE	GRAND STRAND	SC	LPV200	0	1	0	1	0	1
DCM	CHESTER CATAWBA REGIONAL	SC	LPV	0	1	0	1	0	1
DYB	SUMMERVILLE	SC	LPV200	0	1	0	1	0	1
FLO	FLORENCE REGIONAL	SC	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
GGE	GEORGETOWN COUNTY	SC	LPV200	0	1	0	1	0	1
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	1	0	1	0	1
GSP	GREENVILLE-SPARTANBURG INTL - ROGER MILLIKEN	SC	LPV200	0	1	0	1	0	1
GYH	DONALDSON CENTER	SC	LPV	0	1	0	1	0	1
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	1	0	1	0	1
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	1	0	1	0	1
LKR	LANCASTER COUNTY-MC WHIRTER FIELD	SC	LPV200	0	1	0	1	0	1
LQK	PICKENS COUNTY	SC	LPV	0	1	0	1	0	1
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	1	0	1	0	1
MKS	BERKELEY COUNTY	SC	LPV	0	1	0	1	0	1
MYR	MYRTLE BEACH INTL	SC	LPV200	0	1	0	1	0	1
OGB	ORANGEBURG MUNICIPAL	SC	LPV200	0	1	0	1	0	1
RBW	LOWCOUNTRY REGIONAL	SC	LPV200	0	1	0	1	0	1
SMS	SUMTER	SC	LPV200	0	1	0	1	0	1
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SC	LPV200	0	1	0	1	0	1
UDG	DARLINGTON COUNTY JETPORT	SC	LPV	0	1	0	1	0	1
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	0	1	0	1	0	1
0D8	GETTYSBURG MUNICIPAL	SD	LPV200	0	1	0	1	0	1
49B	STURGIS MUNICIPAL	SD	LPV	0	1	0	1	0	1
ABR	ABERDEEN REGIONAL	SD	LPV200	0	1	0	1	0	1
ATY	WATERTOWN REGIONAL	SD	LPV200	0	1	0	1	0	1
BKX	BROOKINGS REGIONAL	SD	LPV	0	1	0	1	0	1
FSD	JOE FOSS FIELD	SD	LPV200	0	1	0	1	0	1
HON	HURON REGIONAL	SD	LPV200	0	1	0	1	0	1
HSR	HOT SPRINGS MUNICIPAL	SD	LP	0	1	0	1	0	1
ICR	WINNER RGNL	SD	LPV	0	1	0	1	0	1
MBG	MOBRIDGE MUNICIPAL	SD	LPV	0	1	0	1	0	1
MDS	MADISON MUNICIPAL	SD	LPV	0	1	0	1	0	1
MHE	MITCHELL MUNICIPAL	SD	LPV	0	1	0	1	0	1
MKA	MILLER MUNICIPAL	SD	LPV200	0	1	0	1	0	1
PIR	PIERRE REGIONAL	SD	LPV	0	1	0	1	0	1
RAP	RAPID CITY REGIONAL	SD	LPV200	0	1	0	1	0	1
SPF	BLACK HILLS-CLYDE ICE FIELD	SD	LPV	0	1	0	1	0	1
VMR	HAROLD DAVIDSON FLD	SD	LPV	0	1	0	1	0	1
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	0	1	0	1	0	1
CKQ8	MCARTHUR RIVER	SK	LPV	0	1	0	1	2	0.999911
CYKJ	KEY LAKE	SK	LPV	0	1	0	1	2	0.999965
0A3	SMITHVILLE MUNICIPAL	TN	LP	0	1	0	1	0	1
0M3	JOHN A BAKER	TN	LP	0	1	0	1	0	1
0M4	BENTON COUNTY	TN	LPV	0	1	0	1	0	1
0M5	HUMPHREYS COUNTY	TN	LP	0	1	0	1	0	1
1A3	MARTIN CAMPBELL FIELD	TN	LP	0	1	0	1	0	1
1M5	PORTLAND MUNICIPAL	TN	LPV	0	1	0	1	0	1
2A0	MARK ANTON	TN	LPV	0	1	0	1	0	1

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
2M8	CHARLES W. BAKER	TN	LPV	0	1	0	1	0	1
3M7	LAFAYETTE MUNICIPAL	TN	LPV	0	1	0	1	0	1
BGF	WINCHESTER MUNICIPAL	TN	LPV	0	1	0	1	0	1
BNA	NASHVILLE INTL	TN	LPV200	0	1	0	1	0	1
CHA	LOVELL FIELD	TN	LPV200	0	1	0	1	0	1
CKV	OUTLAW FIELD	TN	LPV	0	1	0	1	0	1
CSV	CROSSVILLE MEMORIAL-WHITSON FIELD	TN	LPV200	0	1	0	1	0	1
DKX	KNOXVILLE DOWNTOWN ISLAND	TN	LPV	0	1	0	1	0	1
DYR	DYERSBURG REGIONAL	TN	LPV	0	1	0	1	0	1
FYE	FAYETTE CO	TN	LPV	0	1	0	1	0	1
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	1	0	1	0	1
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	1	0	1	0	1
GZS	ABERNATHY FIELD	TN	LPV	0	1	0	1	0	1
HZD	CARROLL COUNTY	TN	LPV	0	1	0	1	0	1
JWN	JOHN C. TUNE	TN	LPV	0	1	0	1	0	1
LUG	ELLINGTON	TN	LPV	0	1	0	1	0	1
M01	GENERAL DEWITT SPAIN	TN	LPV	0	1	0	1	0	1
M33	SUMNER COUNTY REGIONAL	TN	LP	0	1	0	1	0	1
M54	LEBANON MUNICIPAL	TN	LPV	0	1	0	1	0	1
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	1	0	1	0	1
MBT	MURFREESBORO MUNICIPAL	TN	LPV	0	1	0	1	0	1
MEM	MEMPHIS INTL	TN	LPV200	0	1	0	1	0	1
MKL	MC KELLAR-SIPES REGIONAL	TN	LPV200	0	1	0	1	0	1
MMI	MCMINN COUNTY	TN	LPV	0	1	0	1	0	1
MOR	MOORE-MURRELL	TN	LPV	0	1	0	1	0	1
MQY	SMYRNA	TN	LPV	0	1	0	1	0	1
MRC	MAURY COUNTY	TN	LPV	0	1	0	1	0	1
NQA	MILLINGTON REGIONAL JETPORT	TN	LPV	0	1	0	1	0	1
PHT	HENRY COUNTY	TN	LPV200	0	1	0	1	0	1
PVE	BEECH RIVER REGIONAL	TN	LPV	0	1	0	1	0	1
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	1	0	1	0	1
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	1	0	1	0	1
SRB	UPPER CUMBERLAND REGIONAL	TN	LPV200	0	1	0	1	0	1
SYI	BOMAR FIELD-SHELBYVILLE MUNICIPAL	TN	LPV	0	1	0	1	0	1
SZY	ROBERT SIBLEY	TN	LPV	0	1	0	1	0	1
THA	TULLAHOMA REGIONAL/WM NORTHERN FLD	TN	LPV	0	1	0	1	0	1
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	0	1	0	1	0	1
TYS	MCGHEE-TYSON	TN	LPV	0	1	0	1	0	1
UCY	EVERETT-STEWART	TN	LPV200	0	1	0	1	0	1
11R	BRENHAM MUNICIPAL	TX	LPV	0	1	0	1	0	1
2F5	LAMESA MUNICIPAL	TX	LP	0	1	0	1	0	1
2R9	KARNES COUNTY	TX	LP	0	1	0	1	0	1
50R	LOCKHART MUNICIPAL	TX	LPV	0	1	0	1	0	1
5C1	BOERNE STAGE FIELD	TX	LP	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
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	1	0	1	0	1
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 REGIONAL	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	0	1
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	1	0	1	0	1
ARM	WHARTON RGNL	TX	LPV	0	1	0	1	0	1
ASL	HARRISON COUNTY	TX	LPV	0	1	0	1	0	1
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	1	0	1	0	1
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	1	0	1	0	1
BAZ	NEW BRAUNFELS MUNICIPAL	TX	LPV	0	1	0	1	0	1
BBD	CURTIS FIELD	TX	LPV	0	1	0	1	0	1
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV	0	1	0	1	0	1
BPT	SOUTHEAST TEXAS REGIONAL	TX	LPV200	0	1	0	1	0	1
BRO	BROWNSVILLE/SOUTH PADRE ISLAND INTL	TX	LP	0	1	0	1	0	1
BWD	BROWNWOOD RGNL	TX	LPV	0	1	0	1	0	1
BYY	BAY CITY MUNICIPAL	TX	LPV	0	1	0	1	0	1
CFD	COULTER FIELD	TX	LPV	0	1	0	1	0	1
CLL	EASTERWOOD FIELD	TX	LPV200	0	1	0	1	0	1
CNW	TSTC WACO	TX	LPV200	0	1	0	1	0	1
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	1	0	1	0	1
CXO	LONE STAR EXECUTIVE	TX	LPV200	0	1	0	1	0	1
DAL	DALLAS LOVE FIELD	TX	LPV200	0	1	0	1	0	1
DFW	DALLAS-FT WORTH INTL	TX	LPV200	0	1	0	1	0	1
DKR	HOUSTON COUNTY	TX	LP	0	1	0	1	0	1
DRT	DEL RIO INTL	TX	LPV	0	1	0	1	0	1
DTO	DENTON MUNICIPAL	TX	LPV	0	1	0	1	0	1
DUX	MOORE COUNTY	TX	LPV200	0	1	0	1	0	1
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	1	0	1	0	1
E01	ROY HURD MEMORIAL	TX	LP	0	1	0	1	0	1
E11	ANDREWS COUNTY	TX	LPV	0	1	0	1	0	1
E19	GRUVER MUNICIPAL	TX	LP	0	1	0	1	0	1
E30	BRUCE FIELD	TX	LPV	0	1	0	1	0	1
E38	ALPINE-CASPARIS MUNICIPALCIPAL	TX	LP	0	1	0	1	0	1
EBG	EDINBURG INTL	TX	LPV	0	1	0	1	0	1
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	1	0	1	0	1
EFD	ELLINGTON FIELD	TX	LPV200	0	1	0	1	0	1
ELP	EL PASO INTL	TX	LP	0	1	0	1	0	1
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

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
F00	JONES FIELD	TX	LPV	0	1	0	1	0	1
F05	WILBARGER COUNTY	TX	LPV	0	1	0	1	0	1
FST	FT. STOCKTON-PECOS COUNTY	TX	LPV	0	1	0	1	0	1
FTW	FORT WORTH/MEACHAM	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 REGIONAL	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	LPV	0	1	0	1	0	1
GNC	GAINES COUNTY	TX	LPV	0	1	0	1	0	1
GRK	ROBERT GRAY AAF	TX	LPV200	0	1	0	1	0	1
GVT	MAJORS	TX	LPV	0	1	0	1	0	1
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	0	1	0	1	0	1
HBV	JIM HOGG COUNTY	TX	LPV	0	1	0	1	0	1
HDO	HONDO MUNICIPAL	TX	LPV	0	1	0	1	0	1
HOU	WILLIAM P HOBBY	TX	LPV200	0	1	0	1	0	1
HQZ	MESQUITE METRO	TX	LPV	0	1	0	1	0	1
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	1	0	1	0	1
IAH	GEORGE BUSH INTERCONTINENTAL/HOUSTON	TX	LPV200	0	1	0	1	0	1
IKG	KLEBERG COUNTY	TX	LPV	0	1	0	1	0	1
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	1	0	1	0	1
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	1	0	1	0	1
JWY	MID-WAY RGNL	TX	LPV200	0	1	0	1	0	1
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	1	0	1	0	1
LBX	BRAZORIA COUNTY	TX	LPV	0	1	0	1	0	1
LFK	ANGELINA COUNTY	TX	LPV	0	1	0	1	0	1
LHB	HEARNE MUNICIPAL	TX	LPV200	0	1	0	1	0	1
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	1	0	1	0	1
LNC	LANCASTER	TX	LPV200	0	1	0	1	0	1
LRD	LAREDO INTL	TX	LPV200	0	1	0	1	0	1
LUD	DECATUR MUNICIPAL	TX	LPV	0	1	0	1	0	1
LVJ	PEARLAND RGNL	TX	LPV	0	1	0	1	0	1
LXY	MEXIA-LIMESTONE CO	TX	LP	0	1	0	1	0	1
MAF	MIDLAND INTL	TX	LPV	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	0	1
OCH	A L MANGHAM JR REGIONAL	TX	LPV200	0	1	0	1	0	1
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	1	0	1	0	1
ORG	ORANGE COUNTY	TX	LPV	0	1	0	1	0	1
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	1	0	1	0	1
PRX	COX FIELD	TX	LPV	0	1	0	1	0	1
PVW	HALE COUNTY	TX	LPV	0	1	0	1	0	1
RAS	MUSTANG BEACH	TX	LPV	0	1	0	1	0	1
RBD	DALLAS EXECUTIVE	TX	LPV	0	1	0	1	0	1
RKP	ARANSAS COUNTY	TX	LPV	0	1	0	1	0	1
SAT	SAN ANTONIO INTL	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
SGR	SUGAR LAND RGNL	TX	LPV200	0	1	0	1	0	1
SJT	SAN ANGELO REGIONAL/MATHIS FLD	TX	LPV	0	1	0	1	0	1
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV200	0	1	0	1	0	1
SWW	AVENGER FIELD	TX	LPV	0	1	0	1	0	1
T59	WHEELER MUNICIPAL	TX	LP	0	1	0	1	0	1
TFP	T P MC CAMPBELL	TX	LPV	0	1	0	1	0	1
TKI	COLLIN COUNTY REGIONAL 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 REGIONAL	TX	LPV200	0	1	0	1	0	1
TRL	TERRELL MUNICIPAL	TX	LPV	0	1	0	1	0	1
TYR	TYLER POUNDS RGNL	TX	LPV	0	1	0	1	0	1
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	1	0	1	0	1
VCT	VICTORIA	TX	LPV200	0	1	0	1	0	1
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	1	0	1	0	1
BCE	BRYCE CANYON	UT	LPV	0	1	0	1	0	1
BDG	BLANDING MUNICIPAL	UT	LPV	0	1	0	1	0	1
BMC	BRIGHAM CITY	UT	LP	0	1	0	1	0	1
DTA	DELTA MUNICIPAL	UT	LP	0	1	0	1	0	1
ENV	WENDOVER	UT	LPV	0	1	0	1	0	1
FOM	FILLMORE MUNICIPAL	UT	LPV	0	1	0	1	0	1
LGU	LOGAN-CACHE	UT	LPV	0	1	0	1	0	1
OGD	OGDEN-HINCKLEY	UT	LPV	0	1	0	1	0	1
PUC	CARBON COUNTY REGIONAL/BUCK DAVIS FIELD	UT	LP	0	1	0	1	0	1
PVU	PROVO MUNICIPAL	UT	LPV200	0	1	0	1	0	1
SGU	ST GEORGE MUNICIPAL	UT	LPV	0	1	0	1	0	1
SLC	SALT LAKE CITY INTL	UT	LP	0	1	0	1	0	1
U14	NEPHI MUNICIPAL	UT	LPV	0	1	0	1	0	1
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	1	0	1	0	1
VEL	VERNAL	UT	LP	0	1	0	1	0	1
0VG	LEE COUNTY	VA	LPV	0	1	0	1	0	1
AVC	MECKLENBURG-BRUNSWICK REGIONAL	VA	LPV	0	1	0	1	0	1
BCB	VIRGINIA TECH/MONTGOMERY EXECUTIVE	VA	LPV	0	1	0	1	0	1
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV	0	1	0	1	0	1
CJR	CULPEPER RGNL	VA	LPV	0	1	0	1	0	1
CPK	CHESAPEAKE REGIONAL	VA	LPV200	0	1	0	1	0	1
DAN	DANVILLE REGIONAL	VA	LPV200	0	1	0	1	0	1
EMV	EMPORIA-GREENSVILLE REGIONAL	VA	LPV200	0	1	0	1	0	1
FCI	CHESTERFIELD COUNTY	VA	LPV	0	1	0	1	0	1
FKN	FRANKLIN MUN-JOHN BEVERLY ROSE	VA	LPV	0	1	0	1	0	1
FVX	FARMVILLE REGIONAL	VA	LPV	0	1	0	1	0	1
FYJ	MIDDLE PENINSULA RGNL	VA	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
HEF	MANASSAS RGNL/HARRY P DAVIS FL	VA	LPV	0	1	0	1	0	1
HLX	TWIN COUNTY	VA	LPV	0	1	0	1	0	1
HSP	INGALLS FIELD	VA	LPV	0	1	0	1	0	1
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	1	0	1	0	1
JFZ	TAZEWELL COUNTY	VA	LPV	0	1	0	1	0	1
JYO	LEESBURG EXECUTIVE	VA	LPV	0	1	0	1	0	1
LKU	LOUISA COUNTY/FREEMAN FIELD	VA	LPV	0	1	0	1	0	1
LNP	LONESOME PINE	VA	LPV	0	1	0	1	0	1
LUA	LURAY CAVERNS	VA	LP	0	1	0	1	0	1
LYH	LYNCHBURG RGNL/PRESTON GLENN FLD	VA	LPV	0	1	0	1	0	1
MFV	ACCOMACK COUNTY	VA	LPV	0	1	0	1	0	1
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	1	0	1	0	1
MTV	BLUE RIDGE	VA	LPV	0	1	0	1	0	1
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	0	1	0	1	0	1
OKV	WINCHESTER REGIONAL	VA	LPV200	0	1	0	1	0	1
ORF	NORFOLK INTL	VA	LPV200	0	1	0	1	0	1
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	0	1	0	1	0	1
PSK	NEW RIVER VALLEY	VA	LPV200	0	1	0	1	0	1
PTB	DINWIDDIE COUNTY	VA	LPV	0	1	0	1	0	1
RIC	RICHMOND INTL	VA	LPV200	0	1	0	1	0	1
RMN	STAFFORD REGIONAL	VA	LPV	0	1	0	1	0	1
ROA	ROANOKE REGIONAL/WOODRUM FIELD	VA	LPV	0	1	0	1	0	1
SFQ	SUFFOLK EXECUTIVE	VA	LP	0	1	0	1	0	1
SHD	SHENANDOAH VALLEY REGIONAL	VA	LPV200	0	1	0	1	0	1
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	1	0	1	0	1
W63	MARKS MUNICIPAL	VA	LP	0	1	0	1	0	1
W78	WILLIAM M TUCK	VA	LPV	0	1	0	1	0	1
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	1	0	1	0	1
BTV	BURLINGTON INTL	VT	LPV200	0	1	0	1	1	0.999942
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	1	0	1	1	0.999934
MPV	EDWARD F KNAPP STATE	VT	LPV	0	1	0	1	1	0.999934
ALW	WALLA WALLA REGIONAL	WA	LPV	0	1	0	1	0	1
AWO	ARLINGTON MUNICIPAL	WA	LPV200	0	1	1	0.999969	1	0.999969
BLI	BELLINGHAM INTL	WA	LPV	0	1	1	0.999969	1	0.999969
BVS	SKAGIT REGIONAL	WA	LPV	0	1	1	0.999969	1	0.999969
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	1	1	0.999938	1	0.999846
DEW	DEER PARK	WA	LPV	0	1	0	1	0	1
EPH	EPHRATA MUNICIPAL	WA	LPV	0	1	0	1	0	1
FHR	FRIDAY HARBOR	WA	LPV	0	1	1	0.999946	1	0.999946
GEG	SPOKANE INTL	WA	LPV200	0	1	0	1	0	1
HQM	BOWERMAN	WA	LPV200	0	1	1	0.999861	2	0.999776
MWH	GRANT COUNTY INTL	WA	LPV200	0	1	0	1	0	1
OLM	OLYMPIA RGNL	WA	LPV	0	1	1	0.999907	1	0.999873

Airport Id	Airport Name	State/ Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
OTH	SOUTHWEST OREGON RGNL	WA	LPV	0	1	1	0.999803	90	0.992357
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV	0	1	1	0.999961	1	0.999961
PSC	TRI-CITIES	WA	LPV200	0	1	0	1	0	1
PWT	BREMERTON NATIONAL	WA	LPV	0	1	1	0.999931	1	0.999873
RLD	RICHLAND	WA	LPV	0	1	0	1	0	1
RNT	RENTON MUNICIPAL	WA	LPV	0	1	1	0.999961	1	0.999954
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	1	1	0.999950	1	0.999950
TDO	ED CARLSON MEMORIAL - SOUTH LEWIS CO	WA	LPV	0	1	1	0.999896	2	0.999807
TIW	TACOMA NARROWS	WA	LPV	0	1	1	0.999934	1	0.999934
YKM	YAKIMA AIR TERMINAL/MCALLISTER FIELD	WA	LPV200	0	1	0	1	0	1
57C	EAST TROY MUNICIPAL	WI	LPV	0	1	0	1	0	1
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	1	0	1	0	1
ARV	LAKELAND/NOBLE F. LEE MEMORIAL FIELD	WI	LPV	0	1	0	1	0	1
ASX	JOHN F. KENNEDY MEMORIAL	WI	LPV	0	1	0	1	0	1
ATW	OUTAGAMIE COUNTY REGIONAL	WI	LPV200	0	1	0	1	0	1
C29	MIDDLETON MUNICIPAL-MOREY FIELD	WI	LPV	0	1	0	1	0	1
C35	REEDSBURG MUNICIPAL	WI	LP	0	1	0	1	0	1
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	1	0	1	0	1
CMY	SPARTA/FORT MC COY	WI	LPV	0	1	0	1	0	1
CWA	CENTRAL WISCONSIN	WI	LPV200	0	1	0	1	0	1
DLL	BARABOO WISCONSIN DELLS	WI	LPV	0	1	0	1	0	1
EAU	CHIPPEWA VALLEY REGIONAL	WI	LPV200	0	1	0	1	0	1
EGV	EAGLE RIVER UNION	WI	LPV	0	1	0	1	0	1
ENW	KENOSHA RGNL	WI	LPV200	0	1	0	1	0	1
ETB	WEST BEND MUNICIPAL	WI	LPV	0	1	0	1	0	1
FLD	FOND DU LAC COUNTY	WI	LPV	0	1	0	1	0	1
GRB	AUSTIN STRAUBEL INTL	WI	LPV200	0	1	0	1	0	1
HXF	HARTFORD MUNICIPAL	WI	LPV	0	1	0	1	0	1
HYR	SAWYER COUNTY	WI	LPV	0	1	0	1	0	1
JVL	SOUTHERN WISCONSIN REGIONAL	WI	LPV200	0	1	0	1	0	1
LNR	TRI-COUNTY REGIONAL	WI	LPV	0	1	0	1	0	1
LSE	LA CROSSE MUNICIPAL	WI	LPV	0	1	0	1	0	1
LUM	MENOMONIE MUNICIPALCIPAL-SCORE FIELD	WI	LPV	0	1	0	1	0	1
MDZ	TAYLOR COUNTY	WI	LPV	0	1	0	1	0	1
MFI	MARSHFIELD MUNICIPAL	WI	LPV	0	1	0	1	0	1
MKE	GENERAL MITCHELL INTL	WI	LPV200	0	1	0	1	0	1
MSN	DANE COUNTY REGIONAL-TRUAX FIELD	WI	LPV200	0	1	0	1	0	1
MTW	MANITOWOC COUNTY	WI	LPV200	0	1	0	1	0	1
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	1	0	1	0	1
OSH	WITTMAN RGNL	WI	LPV	0	1	0	1	0	1
OVS	BOSCOBEL	WI	LPV	0	1	0	1	0	1
PBH	PRICE COUNTY	WI	LPV	0	1	0	1	0	1
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	1	0	1	0	1
PVB	PLATTEVILLE MUNICIPALCIPAL	WI	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
RAC	JOHN H. BATTEN	WI	LPV	0	1	0	1	0	1
RCX	RUSK COUNTY	WI	LPV	0	1	0	1	0	1
RHI	RHINELANDER-ONEIDA COUNTY	WI	LPV200	0	1	0	1	0	1
RNH	NEW RICHMOND REGIONAL	WI	LPV	0	1	0	1	0	1
RPD	RICE LAKE REGIONAL - CARL'S FIELD	WI	LPV	0	1	0	1	0	1
RRL	MERRILL MUNICIPAL	WI	LPV	0	1	0	1	0	1
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV	0	1	0	1	0	1
STE	STEVENS POINT MUNICIPAL	WI	LPV200	0	1	0	1	0	1
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	1	0	1	0	1
TKV	TOMAHAWK RGNL	WI	LP	0	1	0	1	0	1
UES	WAUKESHA COUNTY	WI	LPV200	0	1	0	1	0	1
UNU	DODGE COUNTY	WI	LPV	0	1	0	1	0	1
3I2	MASON COUNTY	WV	LPV	0	1	0	1	0	1
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	0	1	0	1	0	1
BLF	MERCER COUNTY	WV	LPV	0	1	0	1	0	1
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	1	0	1	0	1
CRW	YEAGER	WV	LPV200	0	1	0	1	0	1
HLG	WHEELING OHIO CO	WV	LPV200	0	1	0	1	0	1
HTS	TRI-STATE/MILTON J. FERGUSON	WV	LPV	0	1	0	1	0	1
I18	JACKSON COUNTY	WV	LPV200	0	1	0	1	0	1
LWB	GREENBRIER VALLEY	WV	LPV	0	1	0	1	0	1
MGW	MORGANTOWN MUNICIPAL-WLB HART FIELD	WV	LPV200	0	1	0	1	0	1
MRB	EASTERN WV REGIONAL/SHEPHERD	WV	LPV	0	1	0	1	0	1
PKB	MID-OHIO VALLEY REGIONAL	WV	LPV	0	1	0	1	0	1
SXL	SUMMERSVILLE	WV	LP	0	1	0	1	0	1
W22	UPSHUR COUNTY REGIONAL	WV	LPV	0	1	0	1	0	1
7V6	CAMP GUERNSEY	WY	LP	0	1	0	1	0	1
COD	YELLOWSTONE REGIONAL	WY	LPV	0	1	0	1	0	1
CPR	NATRONA COUNTY INTL	WY	LPV	0	1	0	1	0	1
CYS	CHEYENNE RGNL/JERRY OLSON FIELD	WY	LPV	0	1	0	1	1	0.999988
DGW	CONVERSE COUNTY	WY	LPV200	0	1	0	1	0	1
ECS	MONDELL FIELD	WY	LPV	0	1	0	1	0	1
EVW	EVANSTON-UINTA COUNTY BURNS FIELD	WY	LPV	0	1	0	1	0	1
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	0	1	0	1	0	1
JAC	JACKSON HOLE	WY	LPV	0	1	0	1	0	1
LAR	LARAMIE REGIONAL	WY	LPV	0	1	0	1	0	1
RIW	RIVERTON REGIONAL	WY	LPV200	0	1	0	1	0	1
RKS	ROCK SPRINGS-SWEETWATER COUNTY	WY	LPV200	0	1	0	1	0	1
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	0	1	0	1	0	1
SAA	SHIVELY FIELD	WY	LPV	0	1	0	1	0	1
SHR	SHERIDAN COUNTY	WY	LPV	0	1	0	1	0	1
CYQH	WATSON LAKE	YT	LPV	0	1	0	1	0	1
CYXY	WHITEHORSE / ERIK NIELSEN INTL	YT	LPV	0	1	0	1	0	1

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

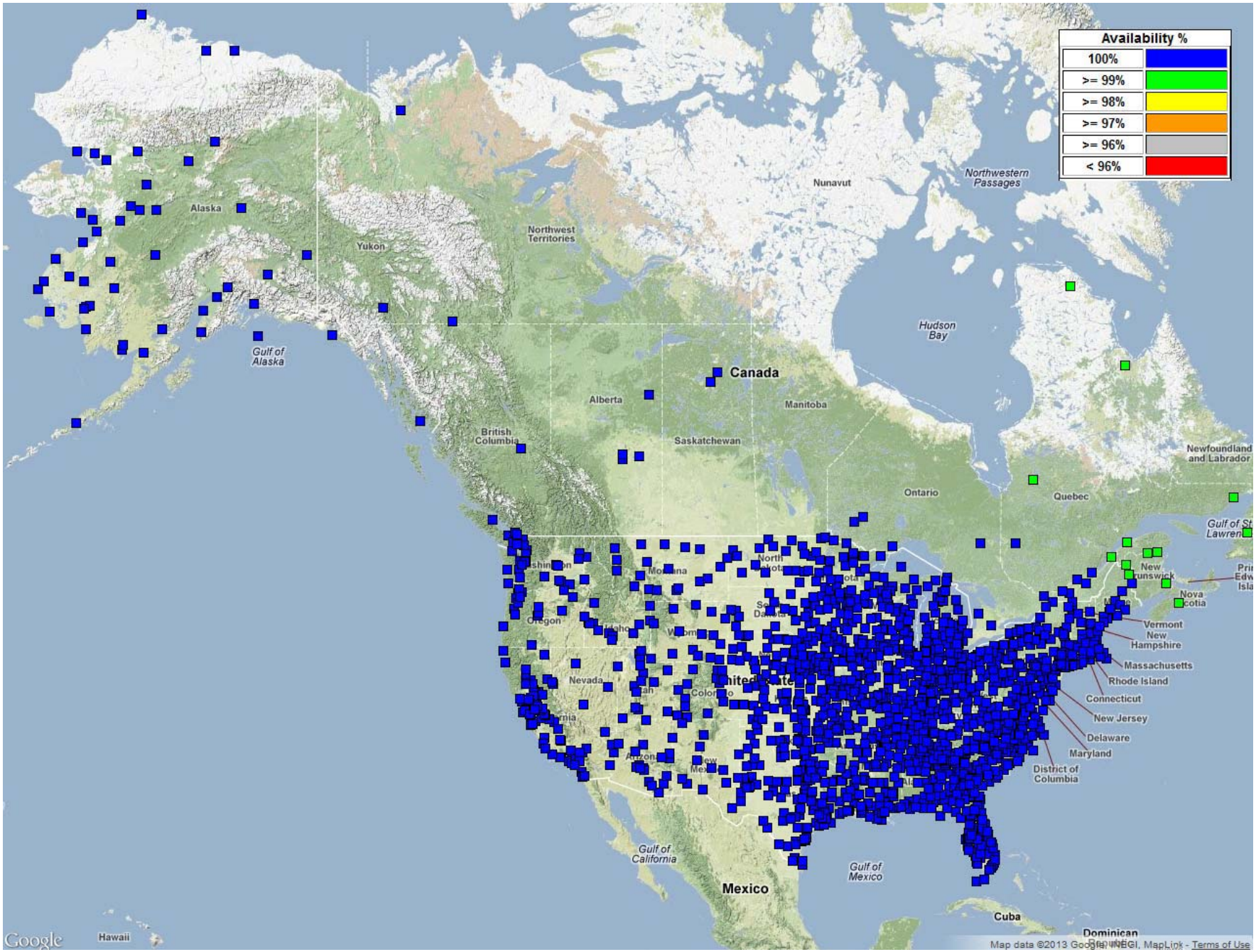


Figure 8.2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

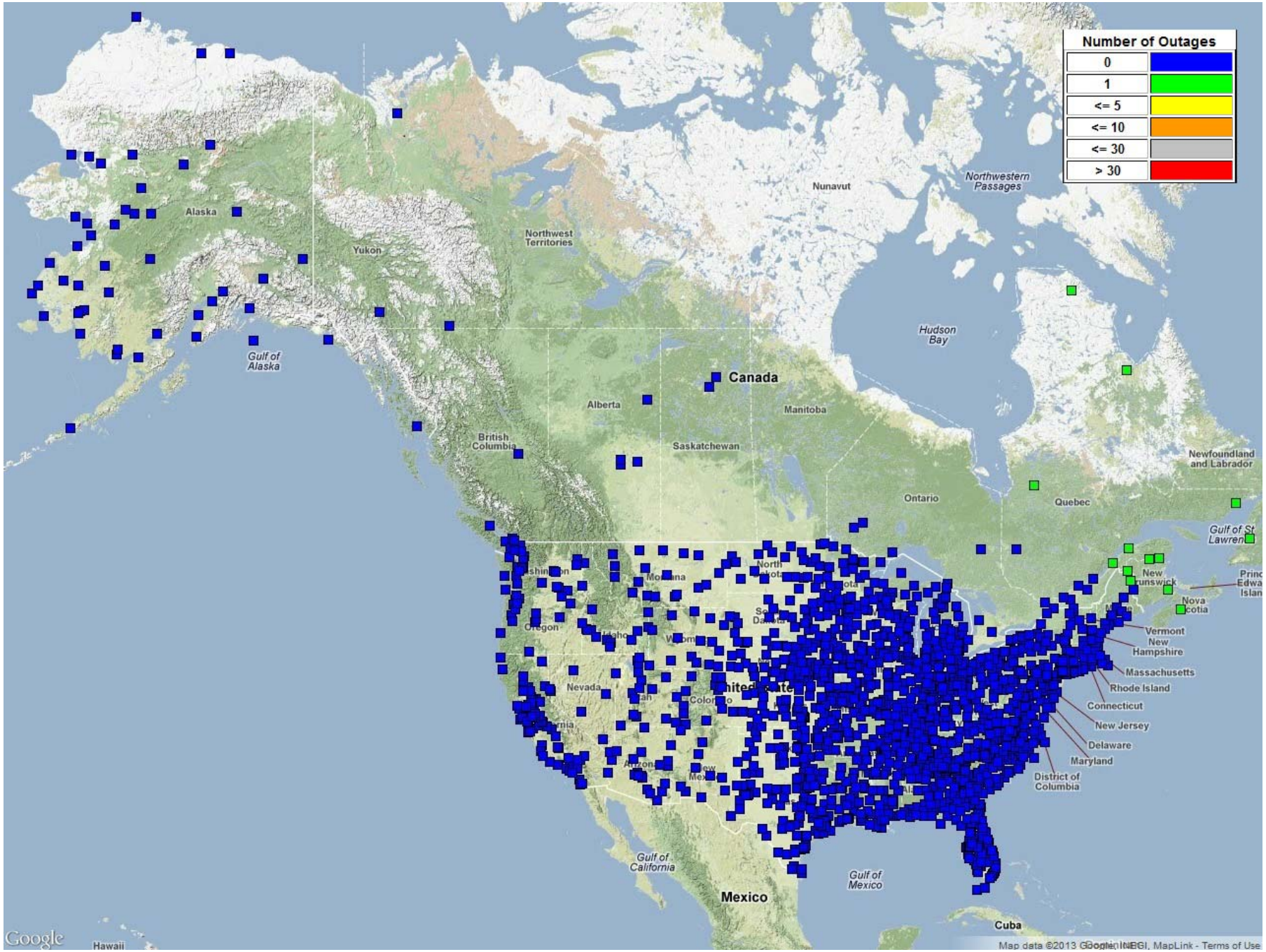


Figure 8.3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

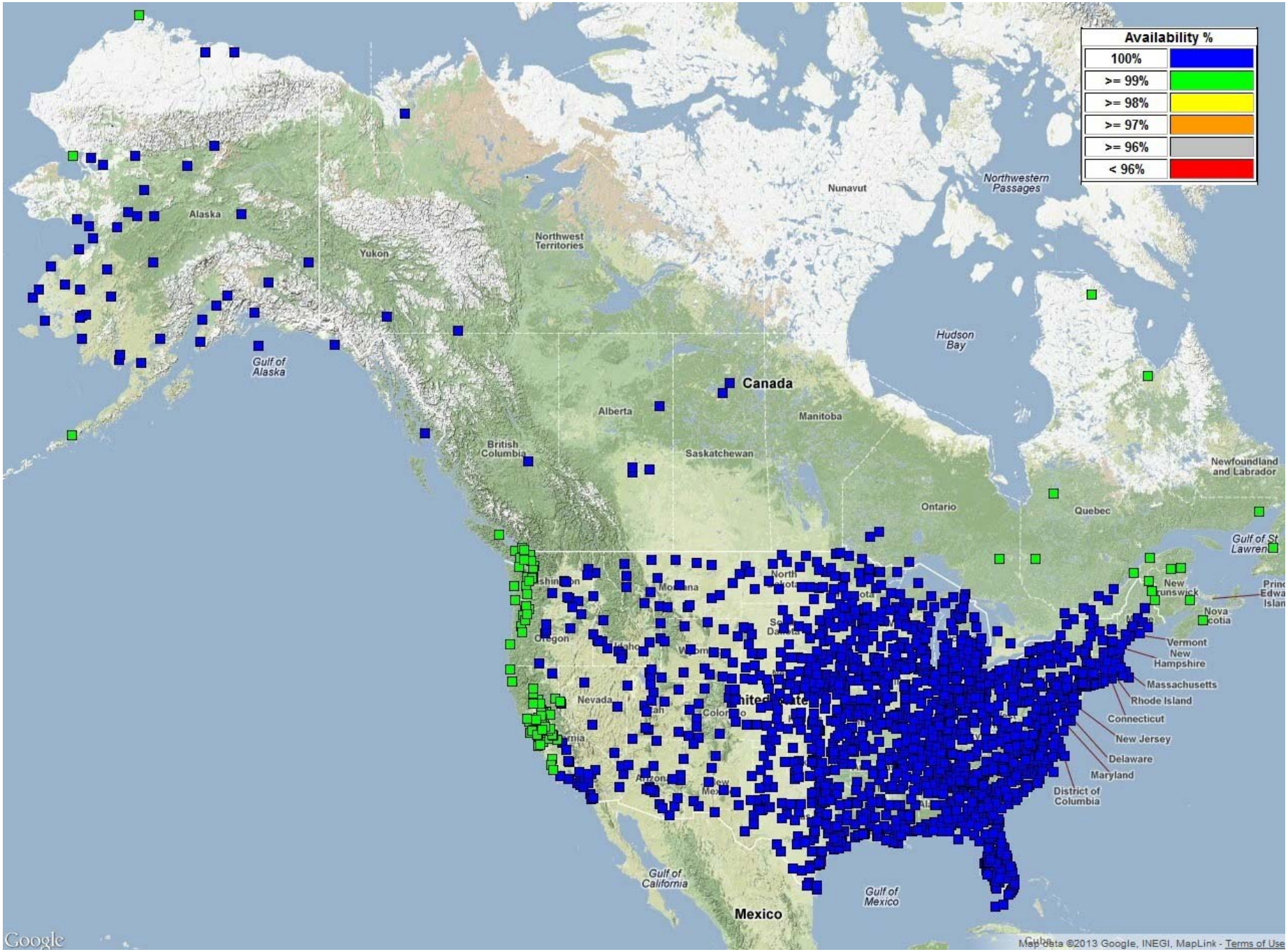


Figure 8.4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

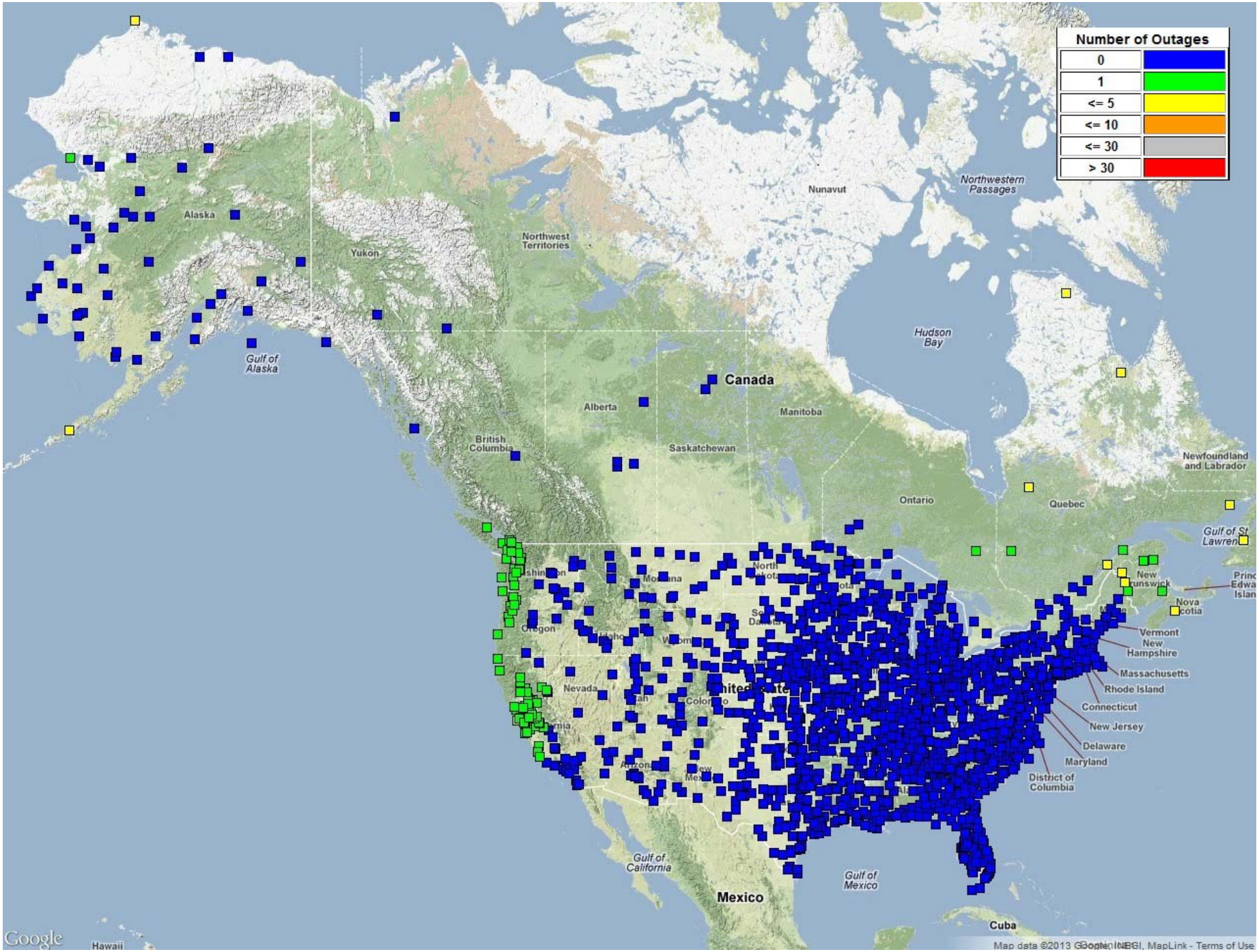


Figure 8.5 WAAS LPV 200 Availability at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures

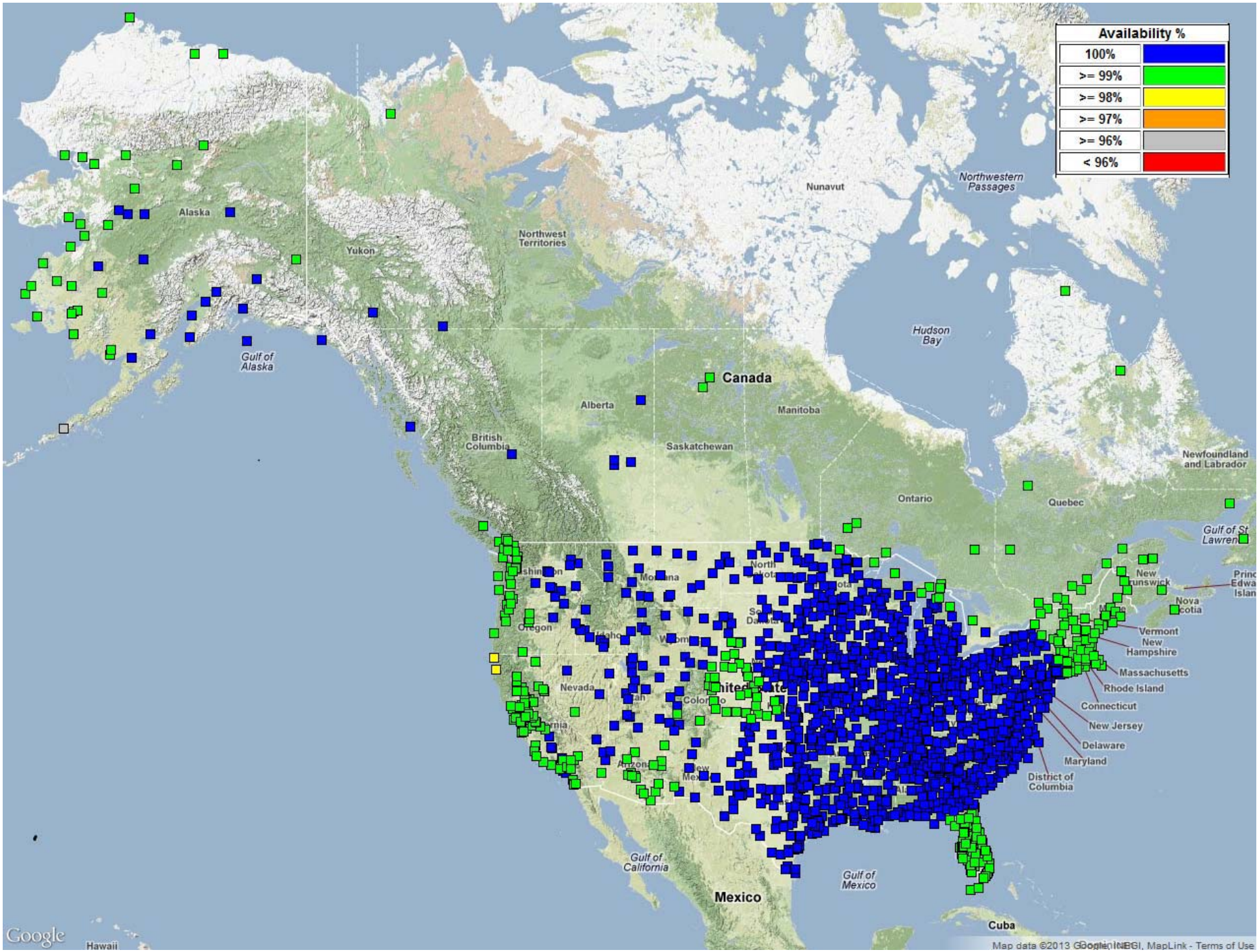
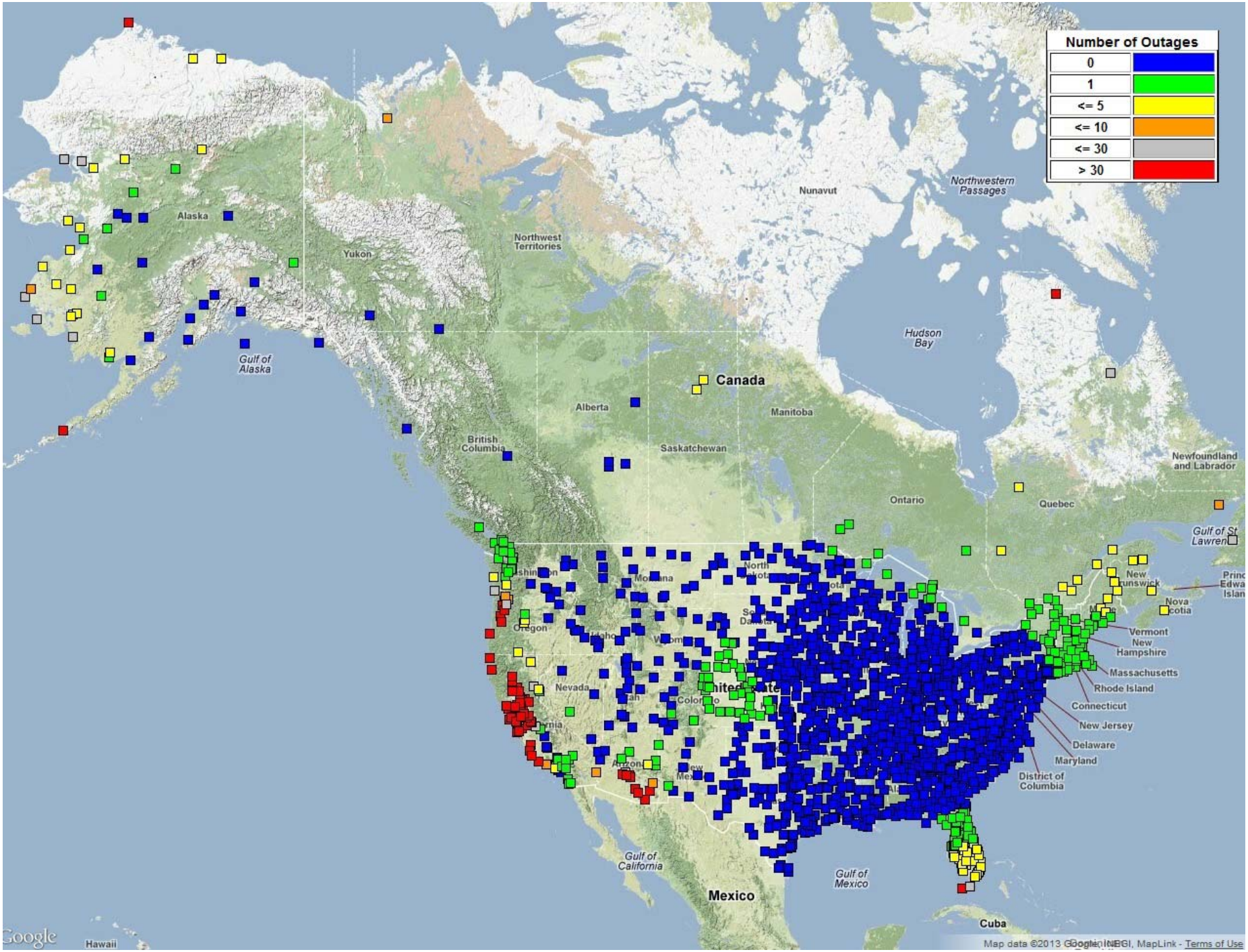


Figure 8.6 WAAS LPV 200 Outages at Airports in the US and Canada with GPS RNAV Instrument Approach Procedures



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 12	May 12	Jun 12	Jul 12	Aug 12	Sep 12	Oct 12	Nov 12	Dec 12	Jan 13	Feb 13	Mar 13
Albuquerque	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Anchorage	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Atlanta	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Barrow	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Bethel	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Billings	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Boston	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Chicago	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Cleveland	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Cold Bay	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Dallas	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Denver	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Fairbanks	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Gander	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Goose Bay	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Honolulu	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Houston	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Iqaluit	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Jacksonville	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●

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

WAAS Site	WRE	Apr 12	May 12	Jun 12	Jul 12	Aug 12	Sep 12	Oct 12	Nov 12	Dec 12	Jan 13	Feb 13	Mar 13
Juneau	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Kansas City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Kotzebue	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Los Angeles	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Memphis	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Merida	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Mexico City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	–	●	●	●	●	●	–	●	●	●
	C	–	●	●	●	●	●	●	●	●	●	●	●
Miami	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Minneapolis	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
New York	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Oakland	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Puerto Vallarta	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Salt Lake City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
San Jose Del Cabo	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
San Juan	A	–	–	–	–	–	–	–	●	●	●	●	●
	B	–	–	–	–	–	–	–	●	●	●	●	●
	C	–	–	–	–	–	–	–	●	●	●	●	●
Seattle	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Tapachula	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Washington, DC	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Winnipeg	A	●	–	–	–	●	●	●	●	●	●	●	●
	B	●	–	–	–	●	●	–	●	●	●	●	●
	C	●	–	–	–	●	●	●	●	●	●	●	●

- ● **Excellent** - 3.29σ bounded 100%
- ● **Good** - 4σ bounded 100%
- ● **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 4/6/13 to 23:59:30 on 4/7/13 with the exceptions of Honolulu thread A (HNL1) and Mexico City thread B (MMX2) which were offline on 4/7/13. A 24 hour data set from 3/15/13 was used for HNL1 and MMX2. Duplicate surveys were performed using both the National Geodetic Survey (NGS) Online Positioning User Service (OPUS) and the Canadian Spatial Reference System (CSRS) Precise Point Positioning (PPP) service. The IGS08 reference frame was selected for the OPUS solutions. The value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing.

The overall RMS quality metrics reported by OPUS were all <= 2.4 cm. The CSRS surveys' RSSs of the reported ECEF sigmas for the 4/7/13 data set were all <= 10 mm. The OPUS and CSRS surveys for the 4/7/13 data set agreed to an average of 1.2 cm., with a standard deviation of 10 mm. The maximum of difference was 3.1 cm. for ZHU1 (Houston TX thread A).

The OPUS positions were compared to the positions in WAAS software Release 3B1 (Build W6.16)) which was installed starting during March 2013. The next release of WAAS software is Release 4.0 (Build W7.006) which is to be fielded later this year. The antenna positions in Release 3B1 were checked against the positions in Release 4.0 and were verified to be identical. With the exceptions of MMX (Mexico City), the OPUS surveys agree with the Release 3B1 positions to better than or equal to 6.6 cm. (maximum was MTP1, Tapachula Mexico thread A). MMX1 as 9.7 cm, MMX2 was 10.9 cm, and MMX3 was 8.6 cm. The average difference excluding MMX was 1.7 cm.

The "take action" threshold established by the WAAS Integrity Performance Panel (WIPP) is 25 cm. for Mexico City and 10 cm. for the remaining sites. The large MMX difference is caused by subsidence.

Table 10-1 lists the WAAS antenna L1 phase center positions as of 4/7/13. The positions are the OPUS estimated positions in IGS08.

Figures 10-1 to 10-3 show the RSS of the ECEF differences between the 4/7/13 OPUS survey antenna phase center locations and the locations in the WAAS Release 3B1 software. Each reference station has three independent strings of WAAS receiving equipment (WRE). A surveyed antenna phase center location is required for each WRE. All three strings of a reference station are shown in the three figures. For example, BET1 identifies the RSS of the ECEF deltas for the Bethel WRE string 1(A). The next two bars in the chart are Bethel string 2(B) and Bethel string 3(C). Figures 10-4 to 10-6 show the OPUS surveys overall RMS quality indications.

Figures 10-7 to 10-9 show the RSS of the ECEF difference between the positions obtained from OPUS and the positions obtained from the Canadian Spatial Reference System (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.

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

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
BET1	-2965385.034	-972576.621	5543892.896	60.7879155527778	-161.8417249194440	52.176
BET2	-2965385.804	-972580.342	5543891.843	60.7878961250000	-161.8416644138890	52.180
BET3	-2965388.368	-972577.475	5543890.970	60.7878802166667	-161.8417290972220	52.171
BIL1	-1416445.877	-4223577.019	4550862.163	45.8037069111111	-108.5397230222220	1112.252
BIL2	-1416449.942	-4223574.873	4550862.877	45.8037161722222	-108.5397813694440	1112.247
BIL3	-1416441.574	-4223574.282	4550866.015	45.8037566250000	-108.5396817444440	1112.251
BRW1	-1886758.916	-809058.662	6018494.483	71.2827650000000	-156.7899247194440	15.576
BRW2	-1886756.331	-809055.920	6018495.662	71.2827977305556	-156.7899666222220	15.583
BRW3	-1886755.246	-809059.702	6018495.476	71.2827930083333	-156.7898576777780	15.565
CDB1	-3484099.054	-1084748.807	5213678.628	55.1923740694444	-162.7064043250000	49.701
CDB2	-3484105.686	-1084741.596	5213675.684	55.1923280833333	-162.7065433861110	49.675
CDB3	-3484111.961	-1084734.823	5213672.936	55.1922846527778	-162.7066742138890	49.689
FAI1	-2304741.796	-1448715.277	5748843.679	64.8096300972222	-147.8473407416670	149.924
FAI2	-2304741.323	-1448706.470	5748846.071	64.8096805194444	-147.8474923777780	149.923
FAI3	-2304732.792	-1448707.403	5748849.216	64.8097471166667	-147.8473801972220	149.906
HNL1	-5508637.099	-2234493.272	2303722.213	21.3129904972222	-157.9208278472220	24.662
HNL2	-5508656.263	-2234483.587	2303686.973	21.3126476416667	-157.9209837777780	25.007
HNL3	-5508647.678	-2234497.523	2303694.068	21.3127162583333	-157.9208282083330	25.054
JNU1	-2354254.884	-2388549.640	5407043.108	58.3625746833333	-134.5857070388890	16.088
JNU2	-2354252.796	-2388565.754	5407036.933	58.3624690861111	-134.5854883861110	16.082
JNU3	-2354239.577	-2388568.607	5407041.399	58.3625455138889	-134.5852933305560	16.083
MMD1	35070.420	-5959686.651	2264365.765	20.9319093000000	-89.6628406861111	29.104
MMD2	35065.493	-5959687.037	2264364.984	20.9319015583333	-89.6628880750000	29.158
MMD3	35065.158	-5959685.243	2264369.642	20.9319466500000	-89.6628911944445	29.145
MMX1	-948701.070	-5943935.374	2109212.637	19.4316536472222	-99.0683897277778	2235.352
MMX2	-948696.636	-5943935.211	2109215.063	19.4316768916667	-99.0683482944444	2235.348
MMX3	-948705.496	-5943935.554	2109210.209	19.4316303416667	-99.0684310611111	2235.370
MPR1	-1570142.219	-5759530.592	2238184.758	20.6790033805556	-105.2492032277780	10.967
MPR2	-1570139.396	-5759530.105	2238188.805	20.6790414472222	-105.2491783166670	11.262
MPR3	-1570143.503	-5759527.983	2238190.573	20.6790594722222	-105.2492217027780	10.982
MSD1	-1979519.760	-5523223.013	2493106.809	23.1604471416667	-109.7176485500000	104.270
MSD2	-1979521.324	-5523225.361	2493100.412	23.1603843111111	-109.7176551916670	104.271
MSD3	-1979525.778	-5523222.077	2493104.079	23.1604203972222	-109.7177069555560	104.253
MTP1	-254854.358	-6162909.175	1617805.066	14.7913659777778	-92.3679992222222	54.951
MTP2	-254850.743	-6162910.194	1617801.637	14.7913340111111	-92.3679652805556	54.915
MTP3	-254855.505	-6162910.302	1617800.109	14.7913199555556	-92.3680094361111	54.820

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
OTZ1	-2396056.014	-750356.164	5843502.523	66.8873322361111	-162.6113728111110	10.890
OTZ2	-2396052.845	-750354.335	5843504.050	66.8873670611111	-162.6113910277780	10.893
OTZ3	-2396052.828	-750358.274	5843503.558	66.8873557555556	-162.6113051333330	10.896
YFB1	1035381.451	-2634289.641	5696539.537	63.7314904972222	-68.5431833611111	10.025
YFB2	1035372.235	-2634296.051	5696538.174	63.7314642138889	-68.5434044500000	9.951
YFB3	1035366.162	-2634306.808	5696534.396	63.7313865472222	-68.5435985138889	10.011
YQX1	2430424.636	-3419640.393	4788223.824	48.9664899472222	-54.5976321444444	146.873
YQX2	2430432.594	-3419639.051	4788220.771	48.9664480750000	-54.5975329388889	146.879
YQX3	2430440.499	-3419637.684	4788217.774	48.9664068777778	-54.5974341277778	146.893
YWG1	-520164.363	-4083475.932	4855843.059	49.9005745166667	-97.2593974555556	222.109
YWG2	-520150.489	-4083468.878	4855850.455	49.9006775250000	-97.2592183027778	222.130
YWG3	-520152.366	-4083477.994	4855842.634	49.9005684166667	-97.2592281861111	222.125
YYR1	1885341.421	-3321428.353	5091171.653	53.3086471472222	-60.4194682861111	37.840
YYR2	1885344.380	-3321419.872	5091176.063	53.3087134388889	-60.4193668750000	37.842
YYR3	1885340.099	-3321413.057	5091182.070	53.3088036194444	-60.4193722583333	37.855
ZAB1	-1488636.834	-5003946.551	3654557.718	35.1735754222222	-106.5673496472220	1620.138
ZAB2	-1488631.501	-5003948.224	3654557.688	35.1735747722222	-106.5672883138890	1620.189
ZAB3	-1488632.276	-5003950.805	3654553.833	35.1735323861111	-106.5672883888890	1620.171
ZAN1	-2659536.634	-1549114.782	5567750.746	61.2292017861111	-149.7802505944440	80.683
ZAN2	-2659548.396	-1549110.832	5567746.265	61.2291181222222	-149.7804243388890	80.690
ZAN3	-2659541.347	-1549106.709	5567750.737	61.2292016750000	-149.7804246138890	80.679
ZAU1	138704.116	-4761244.137	4227763.930	41.7826580694444	-88.3313366861111	195.884
ZAU2	138704.377	-4761248.751	4227758.764	41.7825956750000	-88.3313351638889	195.886
ZAU3	138711.088	-4761248.497	4227758.849	41.7825965972222	-88.3312543833333	195.899
ZBW1	1490299.224	-4448983.174	4306010.497	42.7357204805556	-71.4804258305556	39.118
ZBW2	1490304.333	-4448981.157	4306010.837	42.7357244972222	-71.4803588472222	39.136
ZBW3	1490306.042	-4448984.782	4306006.529	42.7356717000000	-71.4803531194444	39.136
ZDC1	1069125.767	-4839598.981	4001126.503	39.1015958972222	-77.5427464694444	80.057
ZDC2	1069128.161	-4839603.612	4001120.296	39.1015238861111	-77.5427309944444	80.052
ZDC3	1069124.061	-4839602.704	4001122.494	39.1015493111111	-77.5427750111111	80.064
ZDV1	-1273628.604	-4711375.575	4094890.119	40.1873033333333	-105.1272242638890	1541.360
ZDV2	-1273622.902	-4711377.093	4094890.136	40.1873035833333	-105.1271549916670	1541.353
ZDV3	-1273624.916	-4711380.288	4094885.845	40.1872530944444	-105.1271680277780	1541.342
ZFW1	-659983.195	-5324060.784	3438276.480	32.8306497583333	-97.0664717388889	155.629
ZFW2	-659988.461	-5324063.339	3438271.482	32.8305963277778	-97.0665241972222	155.594
ZFW3	-659983.490	-5324063.865	3438271.691	32.8305983500000	-97.0664708194444	155.632
ZHU1	-513864.467	-5506451.715	3166720.478	29.9618963500000	-95.3314262194444	10.860
ZHU2	-513867.115	-5506455.119	3166714.317	29.9618318222222	-95.3314502555556	10.932
ZHU3	-513873.394	-5506457.776	3166708.725	29.9617735694444	-95.3315124694444	10.937

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZJX1	772646.456	-5434462.204	3237231.752	30.6988596500000	-81.9081850055556	2.155
ZJX2	772649.777	-5434463.741	3237228.346	30.6988240722222	-81.9081529444445	2.127
ZJX3	772645.717	-5434466.176	3237225.240	30.6987915138889	-81.9081984805556	2.123
ZKC1	-415247.508	-4954556.388	3982161.121	38.8801594555556	-94.7908337305555	305.900
ZKC2	-415231.117	-4954557.711	3982161.175	38.8801601194444	-94.7906442305556	305.894
ZKC3	-415237.234	-4954561.060	3982155.984	38.8801019638889	-94.7907112527778	305.632
ZLA1	-2474409.936	-4637294.654	3602183.537	34.6035183055556	-118.0838953500000	763.517
ZLA2	-2474404.655	-4637297.442	3602183.538	34.6035184472222	-118.0838302555560	763.496
ZLA3	-2474411.266	-4637297.130	3602179.557	34.6034743916667	-118.0838954361110	763.570
ZLC1	-1808273.204	-4486410.811	4145303.019	40.7860433777778	-111.9521774972220	1287.421
ZLC2	-1808274.601	-4486414.432	4145298.532	40.7859899666667	-111.9521768111110	1287.428
ZLC3	-1808270.389	-4486416.136	4145298.523	40.7859898694444	-111.9521229916670	1287.427
ZMA1	966042.307	-5662999.823	2761581.509	25.8246122722222	-80.3191897277778	-7.582
ZMA2	966029.330	-5662999.106	2761585.986	25.8246600083333	-80.3193161083333	-8.232
ZMA3	966037.411	-5662997.954	2761586.341	25.8246620138889	-80.3192347305556	-7.877
ZME1	4070.898	-5226189.300	3644028.427	35.0673941250000	-89.9553699250000	68.608
ZME2	4070.929	-5226186.754	3644032.542	35.0674376694444	-89.9553695611111	68.888
ZME3	4064.734	-5226186.628	3644032.698	35.0674394972222	-89.9554374777778	68.871
ZMP1	-249978.375	-4539297.500	4458955.058	44.6374633055556	-93.1520854027778	262.659
ZMP2	-249972.574	-4539297.839	4458955.058	44.6374631805556	-93.1520121666667	262.672
ZMP3	-249973.672	-4539302.117	4458950.584	44.6374071472222	-93.1520230194445	262.611
ZNY1	1406144.635	-4627343.978	4144322.052	40.7843285805556	-73.0971656666667	6.442
ZNY2	1406146.432	-4627347.011	4144317.272	40.7842758472222	-73.0971557444444	5.913
ZNY3	1406140.875	-4627348.667	4144317.311	40.7842762972222	-73.0972244388889	5.914
ZOA1	-2684436.855	-4293337.421	3865351.862	37.5430538472222	-122.0159475333330	-3.499
ZOA2	-2684433.845	-4293341.488	3865349.423	37.5430262500000	-122.0158942555560	-3.516
ZOA3	-2684438.227	-4293342.371	3865345.575	37.5429818944444	-122.0159310027780	-3.425
ZOB1	650770.190	-4754715.670	4187420.753	41.2971544777778	-82.2064446527778	223.682
ZOB2	650777.865	-4754714.838	4187422.764	41.2971667944444	-82.2063525222222	225.172
ZOB3	650776.197	-4754719.659	4187414.973	41.29708705	-82.20638006	223.449
ZSE1	-2308930.262	-3668169.675	4663526.481	47.2869933194444	-122.1883727416670	82.098
ZSE2	-2308934.654	-3668175.218	4663520.073	47.2869077583333	-122.1883828416670	82.159
ZSE3	-2308935.714	-3668179.495	4663516.130	47.2868560472222	-122.1883645833330	82.100
ZSU1	2462589.434	-5529372.139	2003724.462	18.4313356222222	-65.9934768750000	-28.088
ZSU2	2462587.509	-5529377.508	2003712.179	18.4312185694444	-65.9935141972222	-28.061
ZSU3	2462594.136	-5529375.239	2003710.097	18.4311989416667	-65.9934481555556	-28.128
ZTL1	529840.420	-5305248.797	3489342.853	33.3796886694444	-84.2967258138889	261.127
ZTL2	529846.789	-5305247.956	3489343.129	33.3796917583333	-84.2966568111111	261.109
ZTL3	529847.475	-5305251.396	3489337.895	33.3796350388889	-84.2966531500000	261.144

Figure 10-1 WAAS Release 3B1 Software Antenna Positions Deltas from 4/7/13 OPUS Survey

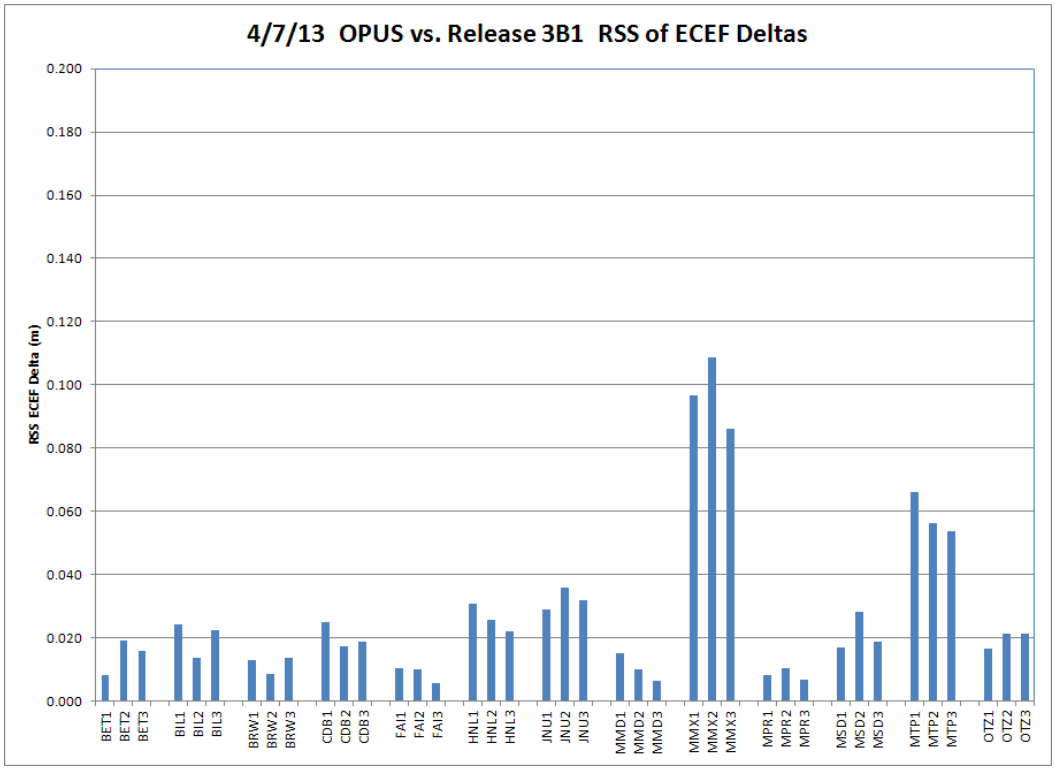


Figure 10-2 WAAS Release 3B1 Software Antenna Positions Deltas from 4/7/13 OPUS Survey

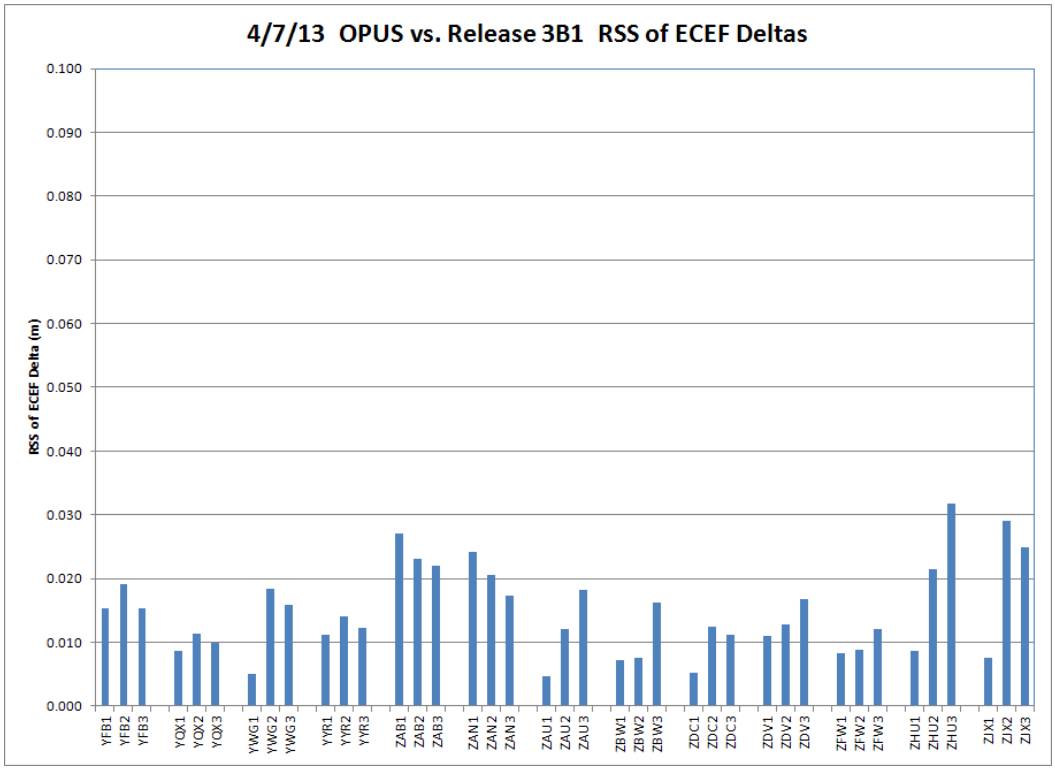


Figure 10-3 WAAS Release 3B1 Software Antenna Positions Deltas from 4/7/13 OPUS Survey

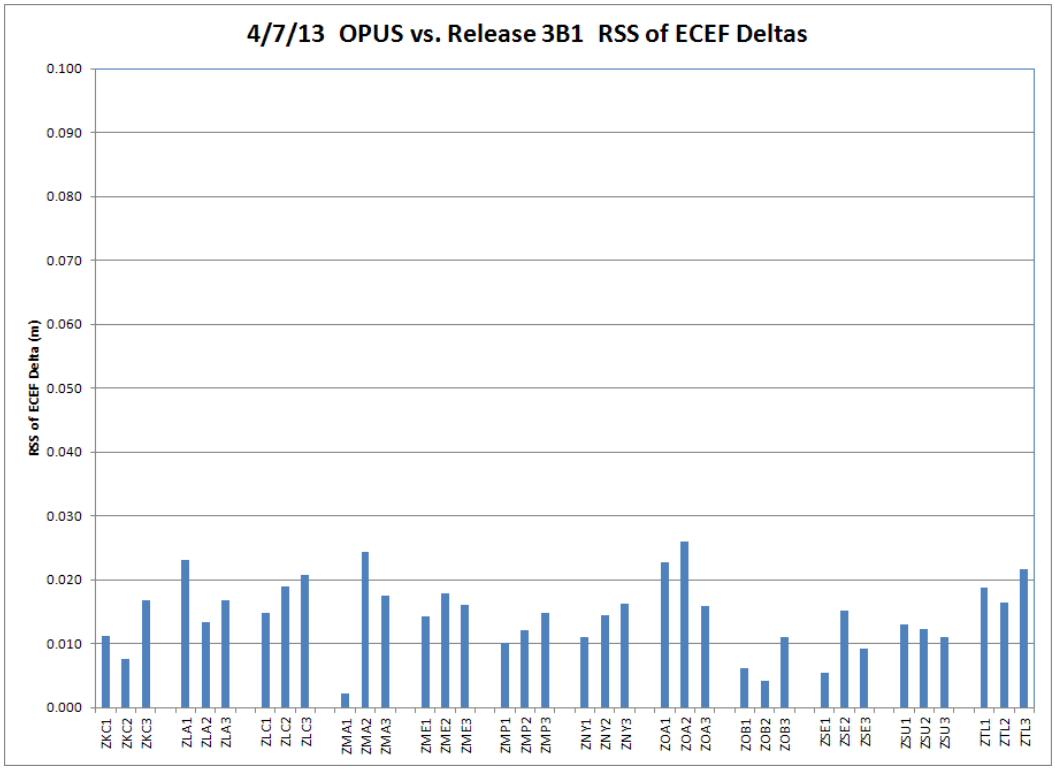


Figure 10-4 4/7/13 OPUS Survey Overall RMS Qualities

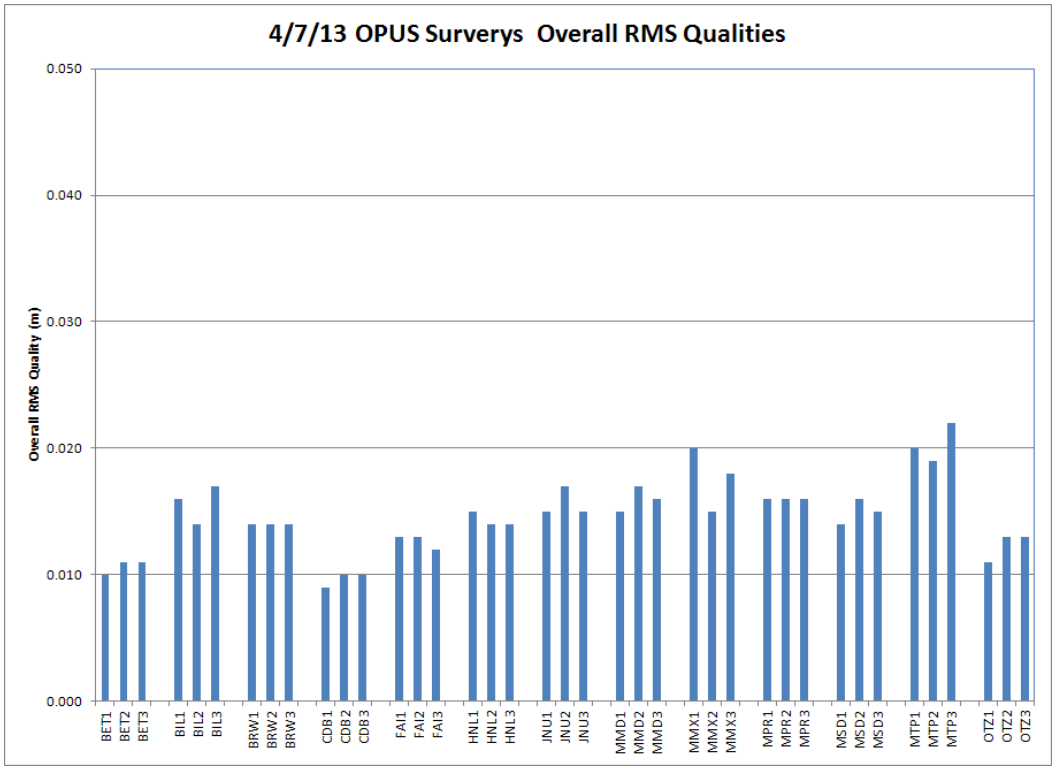


Figure 10-5 4/7/13 OPUS Survey Overall RMS Qualities

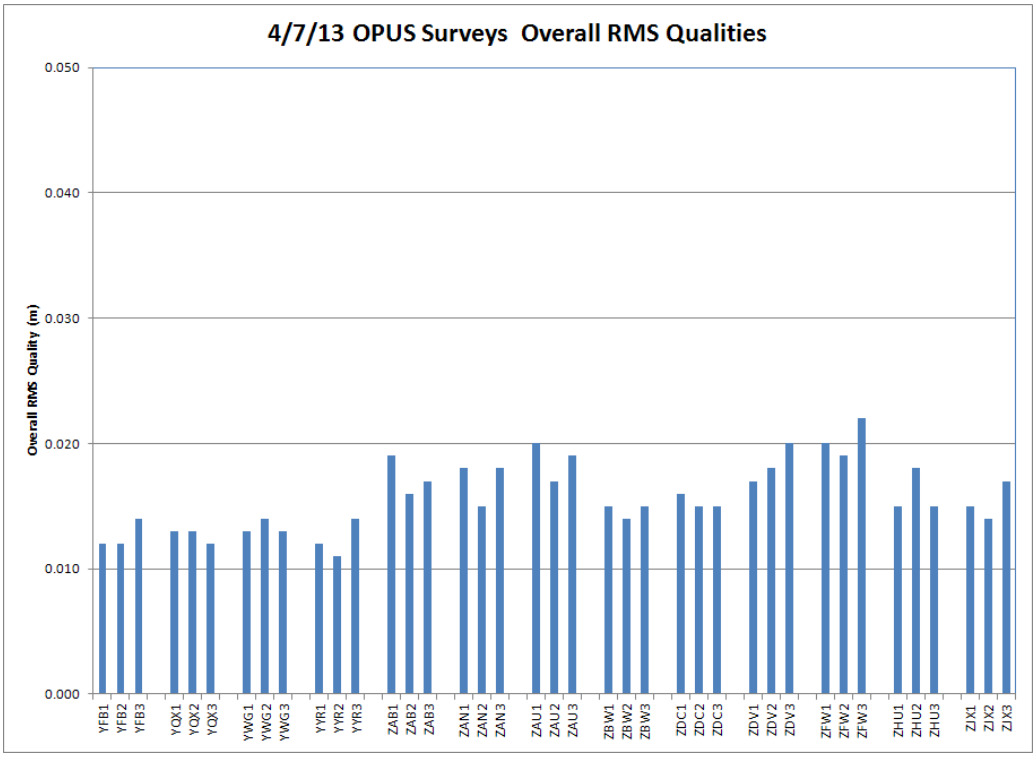


Figure 10-6 4/7/13 OPUS Survey Overall RMS Qualities

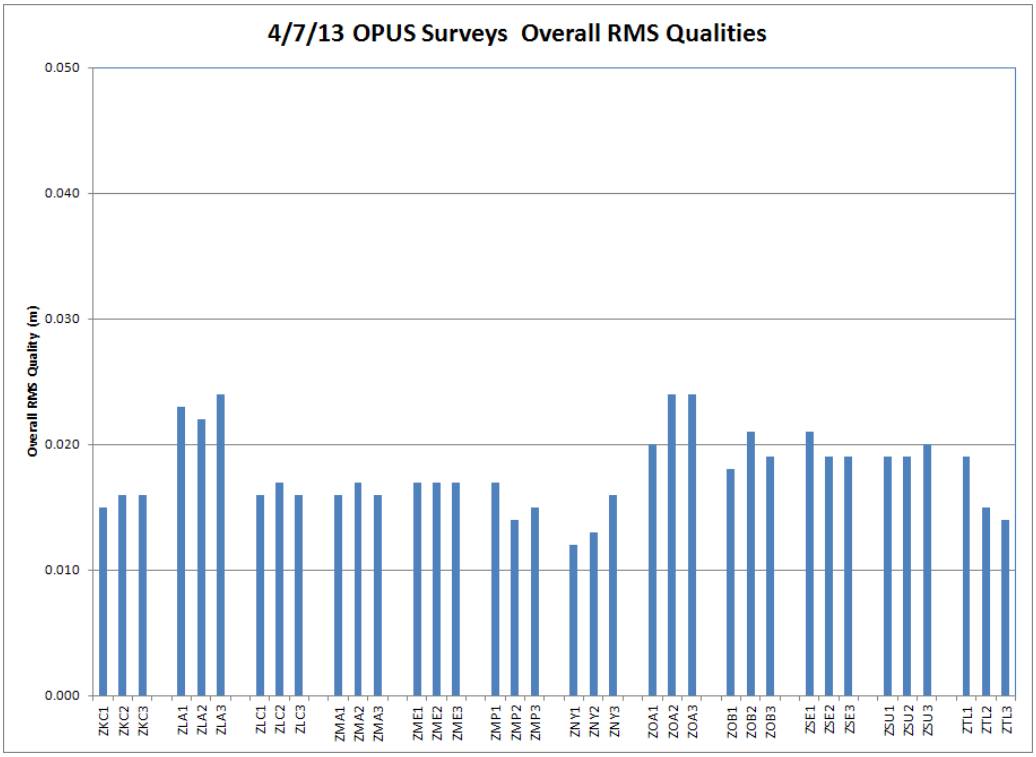


Figure 10-7 4/7/13 OPUS vs. CSRS RSS ECEF Deltas

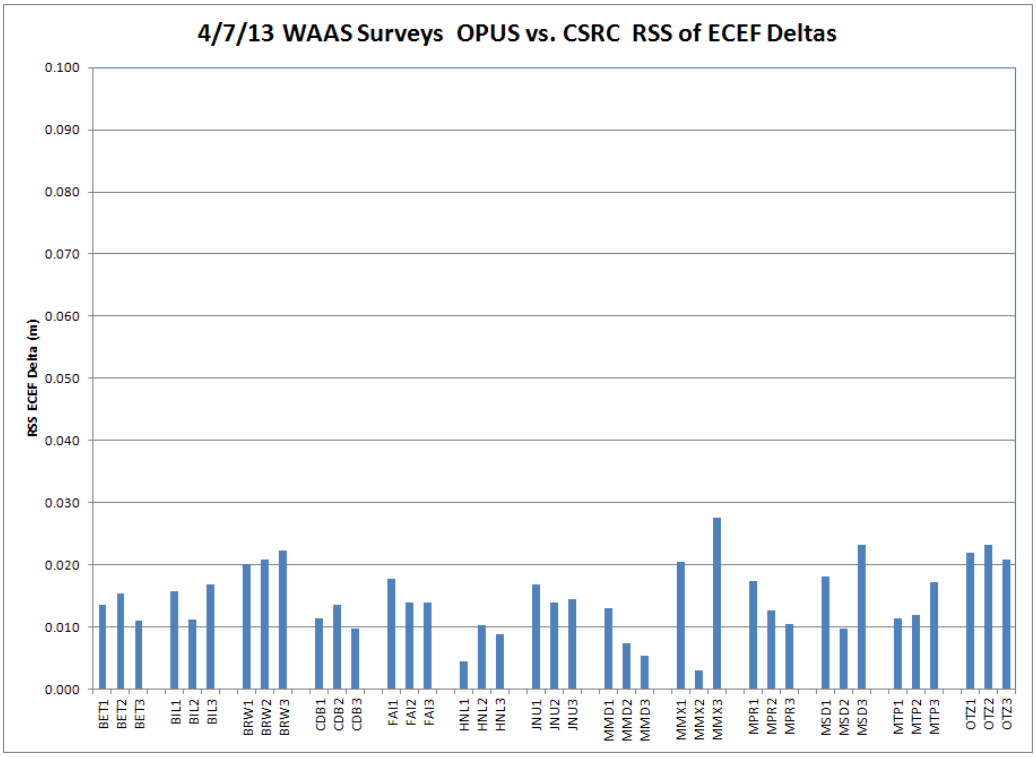


Figure 10-8 4/7/13 OPUS vs. CSRS RSS ECEF Deltas

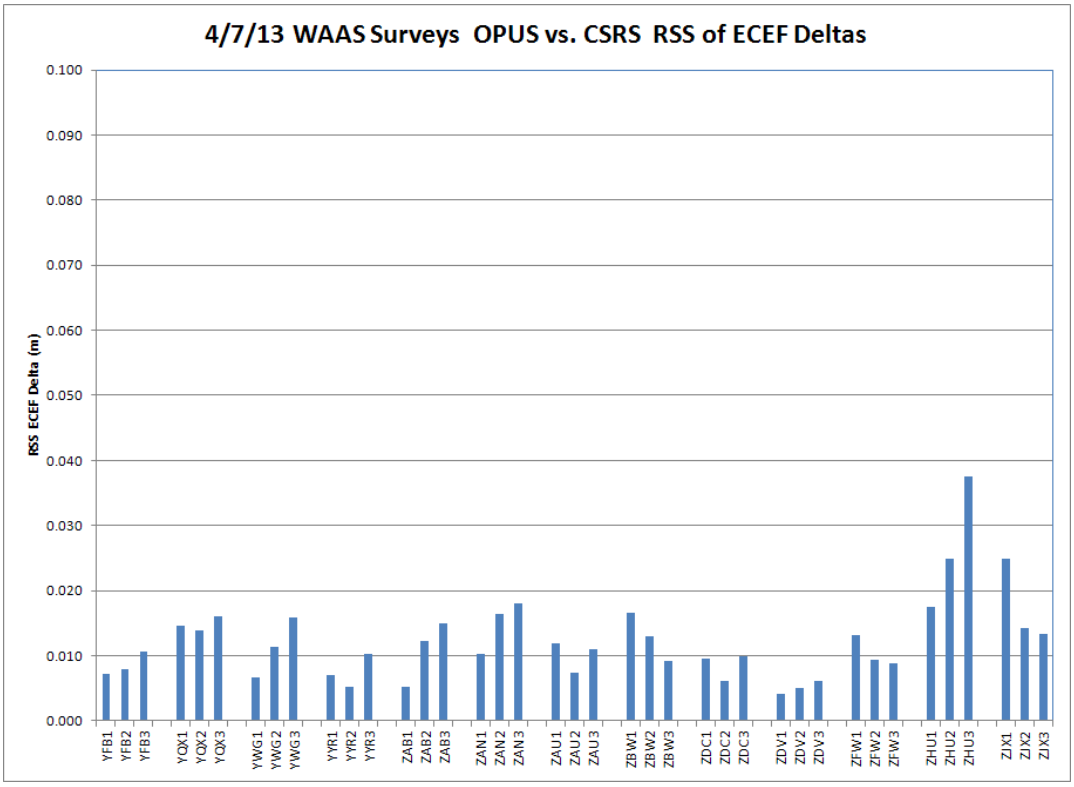


Figure 10-9 4/7/13 OPUS vs. CSRS RSS ECEF Deltas

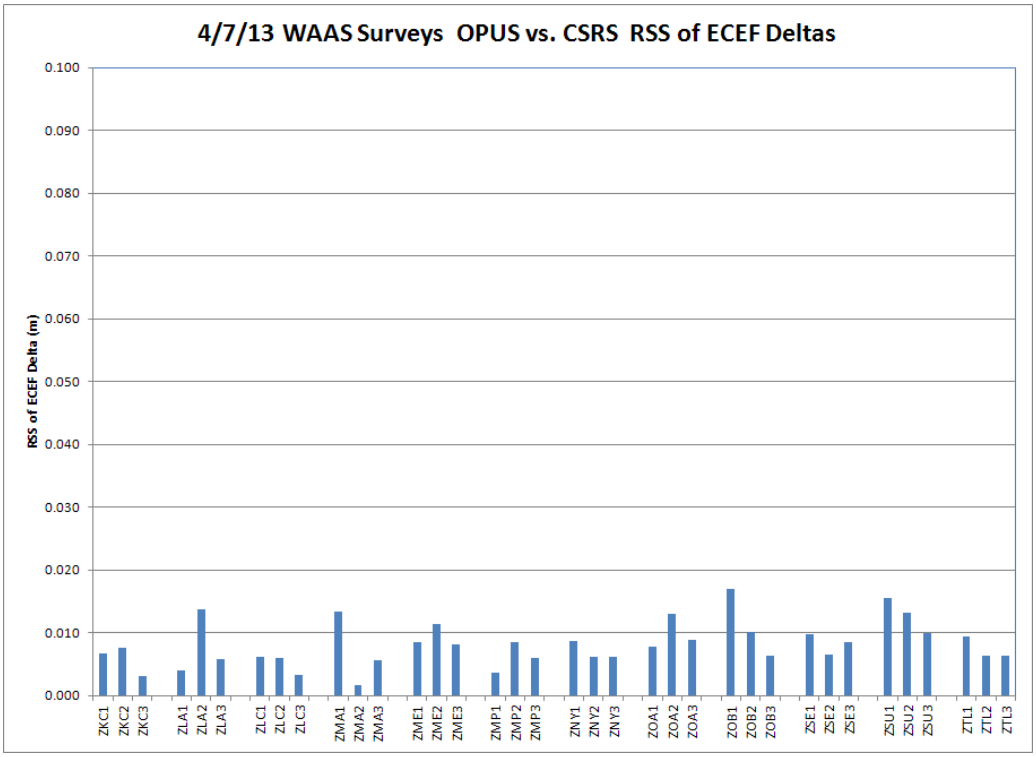


Figure 10-10 4/7/13 CSRS Survey Qualities

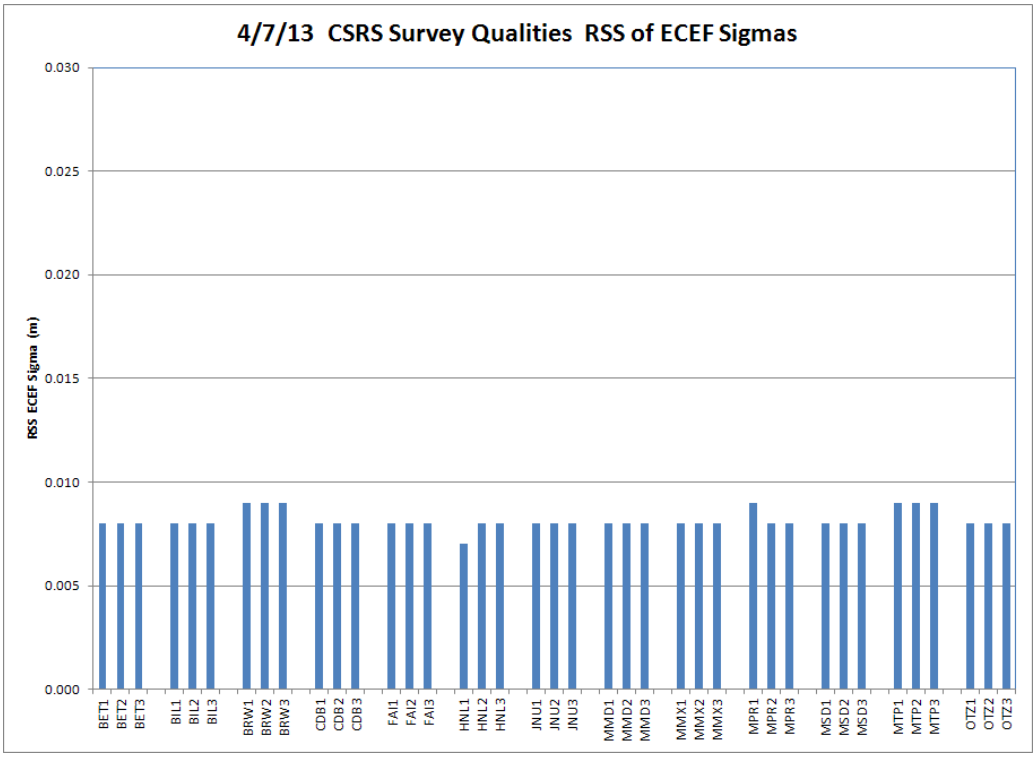


Figure 10-11 4/7/13 CSRS Survey Qualities

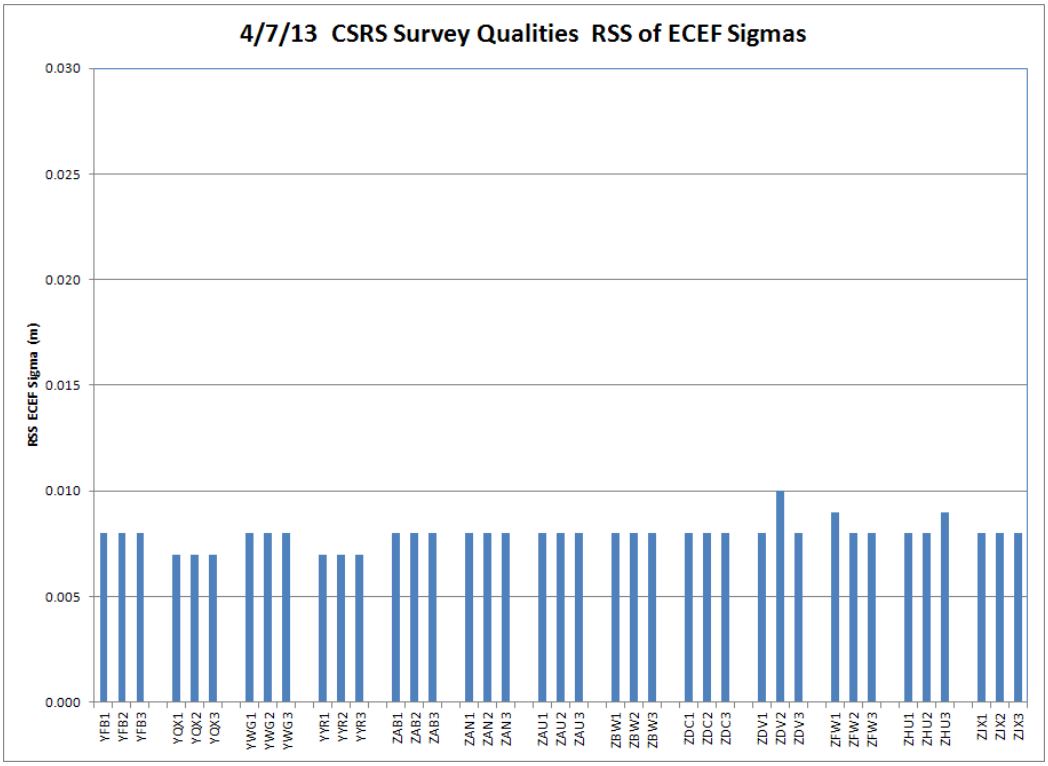
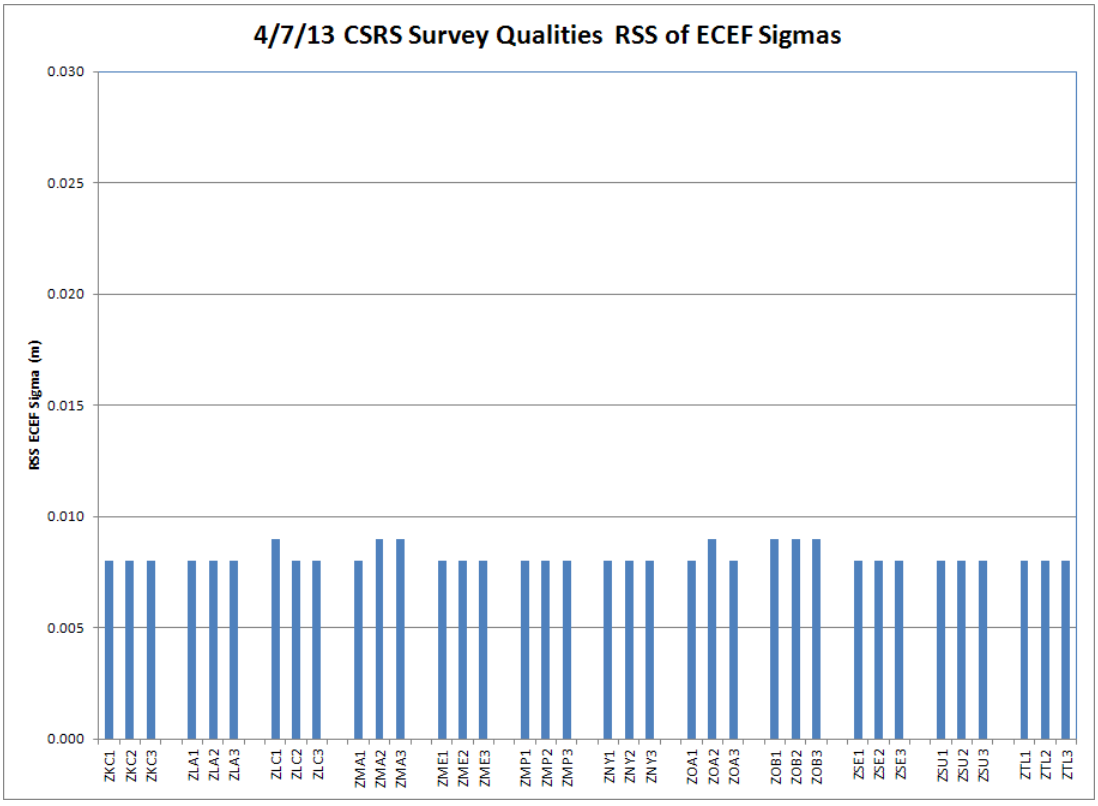


Figure 10-12 4/7/13 CSRS Survey Qualities



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.

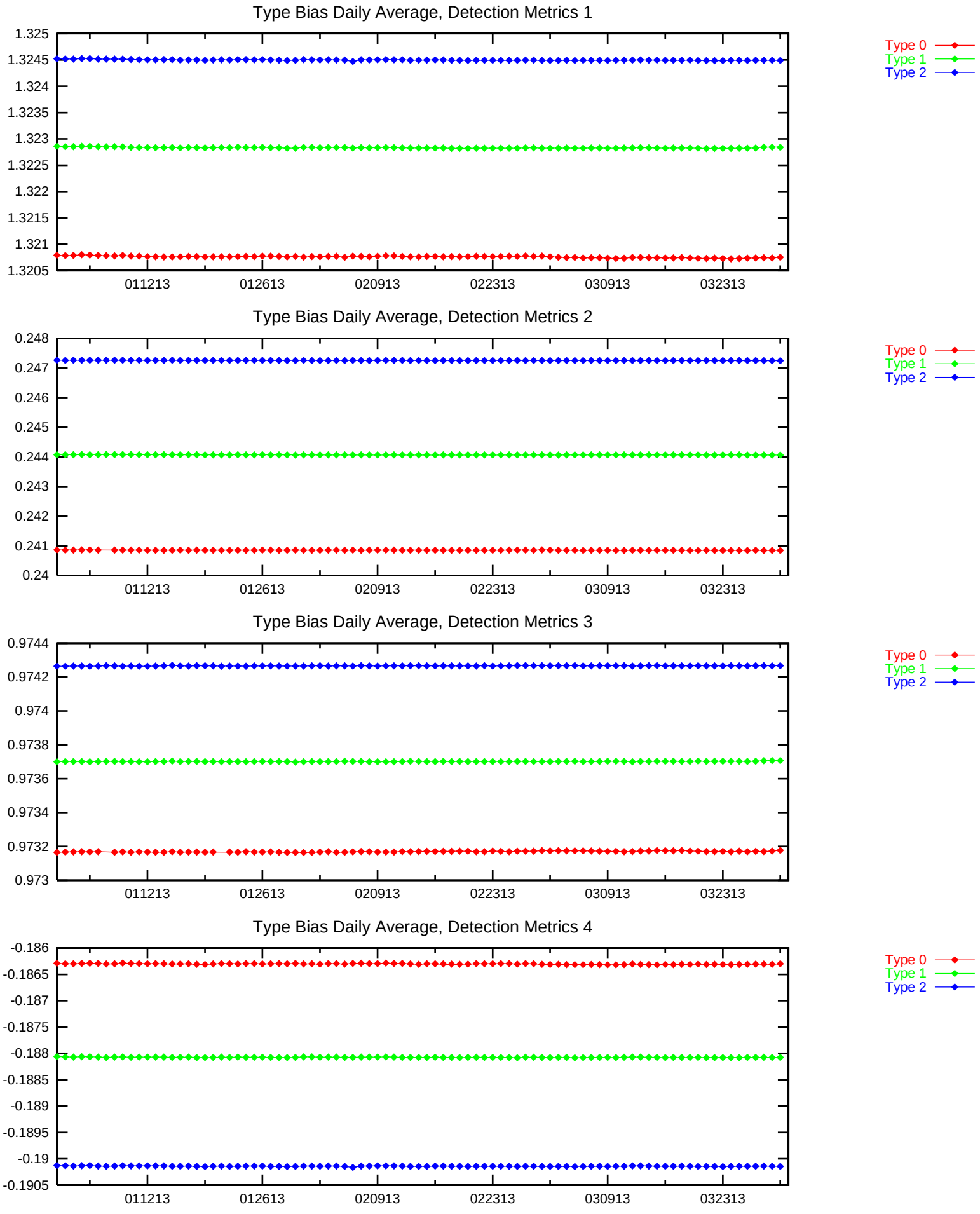
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3207600	1.3228300	1.3245000
DM 2	0.2408530	0.2440690	0.2472540
DM 3	0.9731700	0.9737020	0.9742660
DM 4	-0.1863030	-0.1880740	-0.1901390

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3209300	1.3228800	1.3246000
DM 2	0.2408470	0.2440960	0.2472770
DM 3	0.9731740	0.9737090	0.9742760
DM 4	-0.1862030	-0.1880640	-0.1900970

Figure 11-1 PRN Type Bias Average Trend



11.3 PRN Bias

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

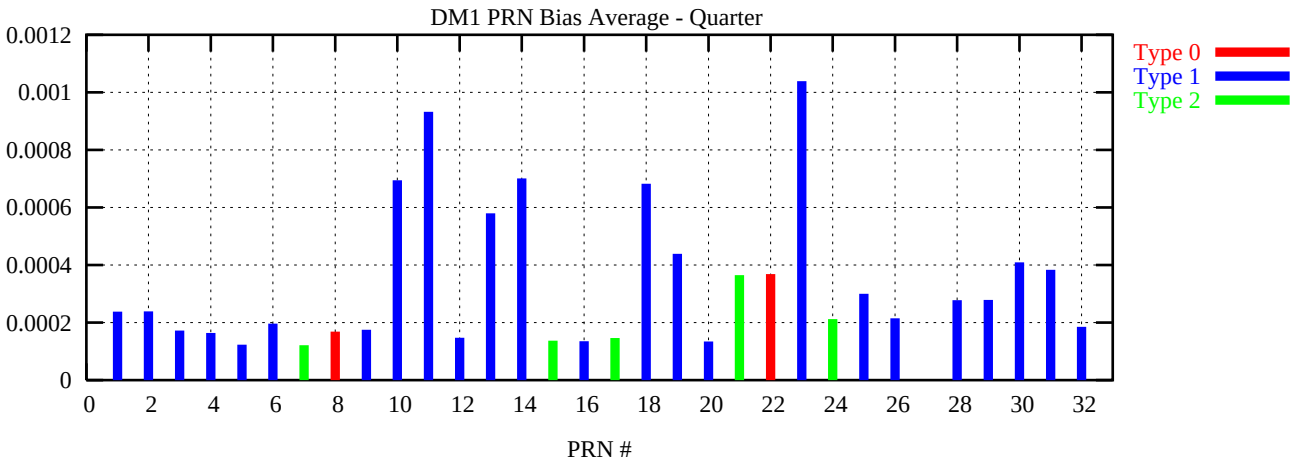
Table 11-4 and Figure 11-2 show the rollup PRN bias average for the quarter. Figures 11-3 to 11-10 show the PRN bias average trend for each SV. The maximum average for DM1 for this quarter is PRN 23 at 0.001039. The maximum average for DM2 is PRN 11 at 0.0001968 The maximum average for DM3 is PRN 10 at 0.0002717 and the maximum average for DM4 is PRN 23 at 0.0004361.

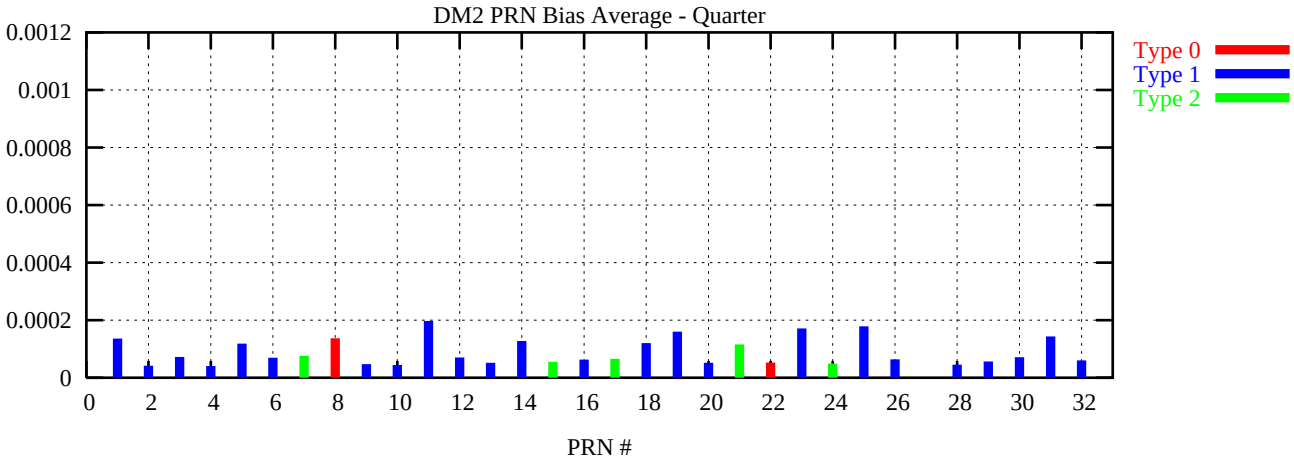
For this reporting period, geostationary satellite biases are not evaluated. Please refer to Table 1-5 for events that may have an impact on PRN bias statistics. The small spikes in PRN bias daily average are due to satellite outages. On the days of satellite maintenance, partial data resulted in a slightly varied PRN bias daily average compared to full day data average. PRN 27 went offline on 10/6/12 and remained offline for this reporting quarter.

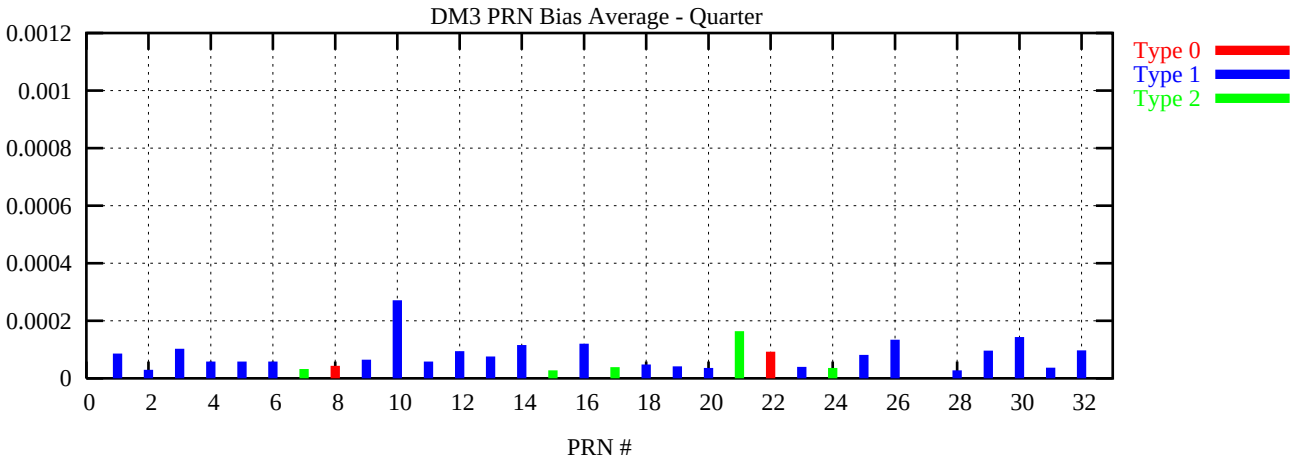
Table 11-4 PRN Bias Average for the Quarter

PRN	SVN	DM1	DM2	DM3	DM4
1	63	0.0002380	0.0001358	0.0000863	0.0000986
2	61	0.0002385	0.0000419	0.0000296	0.0000957
3	33	0.0001719	0.0000720	0.0001027	0.0003297
4	34	0.0001641	0.0000410	0.0000583	0.0001154
5	50	0.0001229	0.0001183	0.0000584	0.0001046
6	36	0.0001962	0.0000693	0.0000588	0.0001079
7	34	0.0001214	0.0000761	0.0000321	0.0001314
8	38	0.0001687	0.0001367	0.0000432	0.0001110
9	39	0.0001748	0.0000472	0.0000651	0.0001111
10	40	0.0006945	0.0000440	0.0002717	0.0000960
11	46	0.0009328	0.0001968	0.0000586	0.0002574
12	58	0.0001468	0.0000706	0.0000946	0.0000769
13	43	0.0005793	0.0000515	0.0000763	0.0001669
14	41	0.0007007	0.0001280	0.0001156	0.0001332
15	55	0.0001367	0.0000554	0.0000279	0.0001472
16	56	0.0001356	0.0000628	0.0001203	0.0003364
17	53	0.0001460	0.0000661	0.0000386	0.0001293
18	54	0.0006828	0.0001203	0.0000486	0.0002431
19	59	0.0004386	0.0001603	0.0000421	0.0000941
20	51	0.0001347	0.0000517	0.0000364	0.0001567
21	45	0.0003644	0.0001160	0.0001640	0.0001077
22	47	0.0003686	0.0000532	0.0000928	0.0003341
23	60	0.0010390	0.0001710	0.0000395	0.0004361
24	65	0.0002124	0.0000492	0.0000365	0.0001071
25	62	0.0002999	0.0001787	0.0000815	0.0001155
26	26	0.0002149	0.0000640	0.0001338	0.0000942
27	27				
28	44	0.0002777	0.0000458	0.0000281	0.0000913
29	57	0.0002791	0.0000562	0.0000960	0.0003030
30	30	0.0004094	0.0000717	0.0001433	0.0001194
31	52	0.0003838	0.0001433	0.0000370	0.0002392
32	23	0.0001848	0.0000598	0.0000976	0.0000937

Figure 11-2 PRN Bias Average for the Quarter







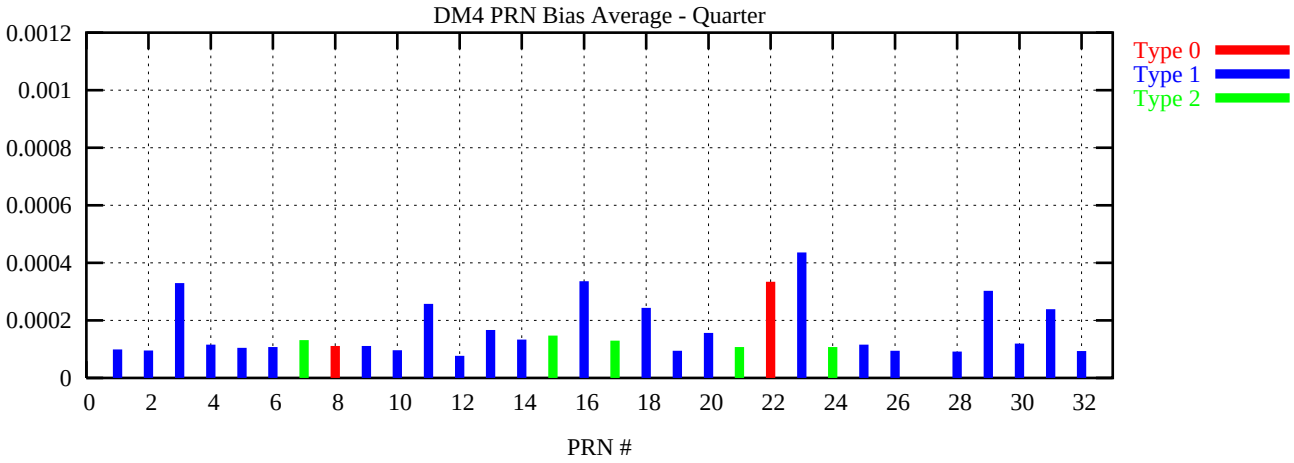


Figure 11-3 PRN Bias Average Trend (PRN 1 - PRN 4)

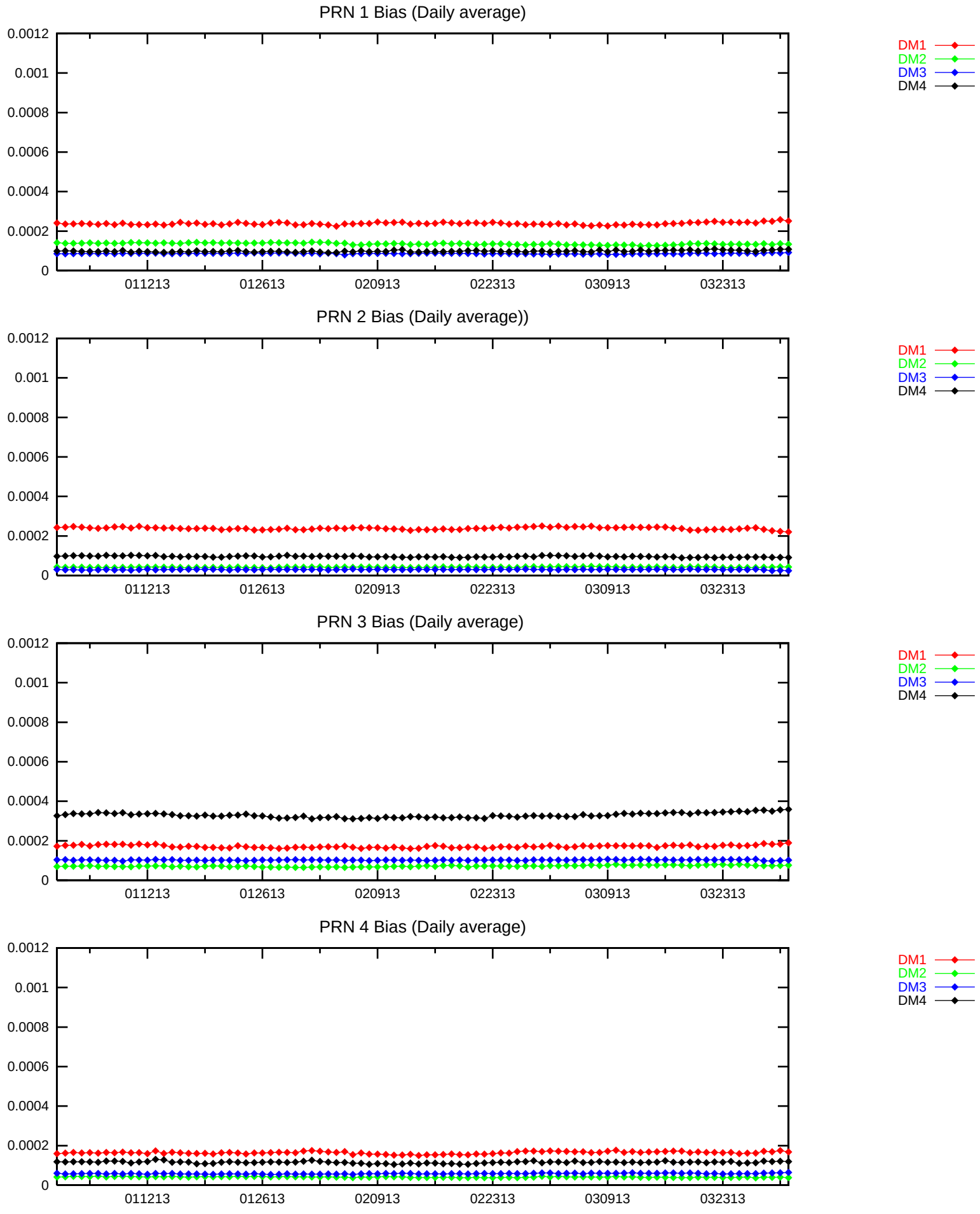


Figure 11-4 PRN Bias Average Trend (PRN 5 - PRN 8)

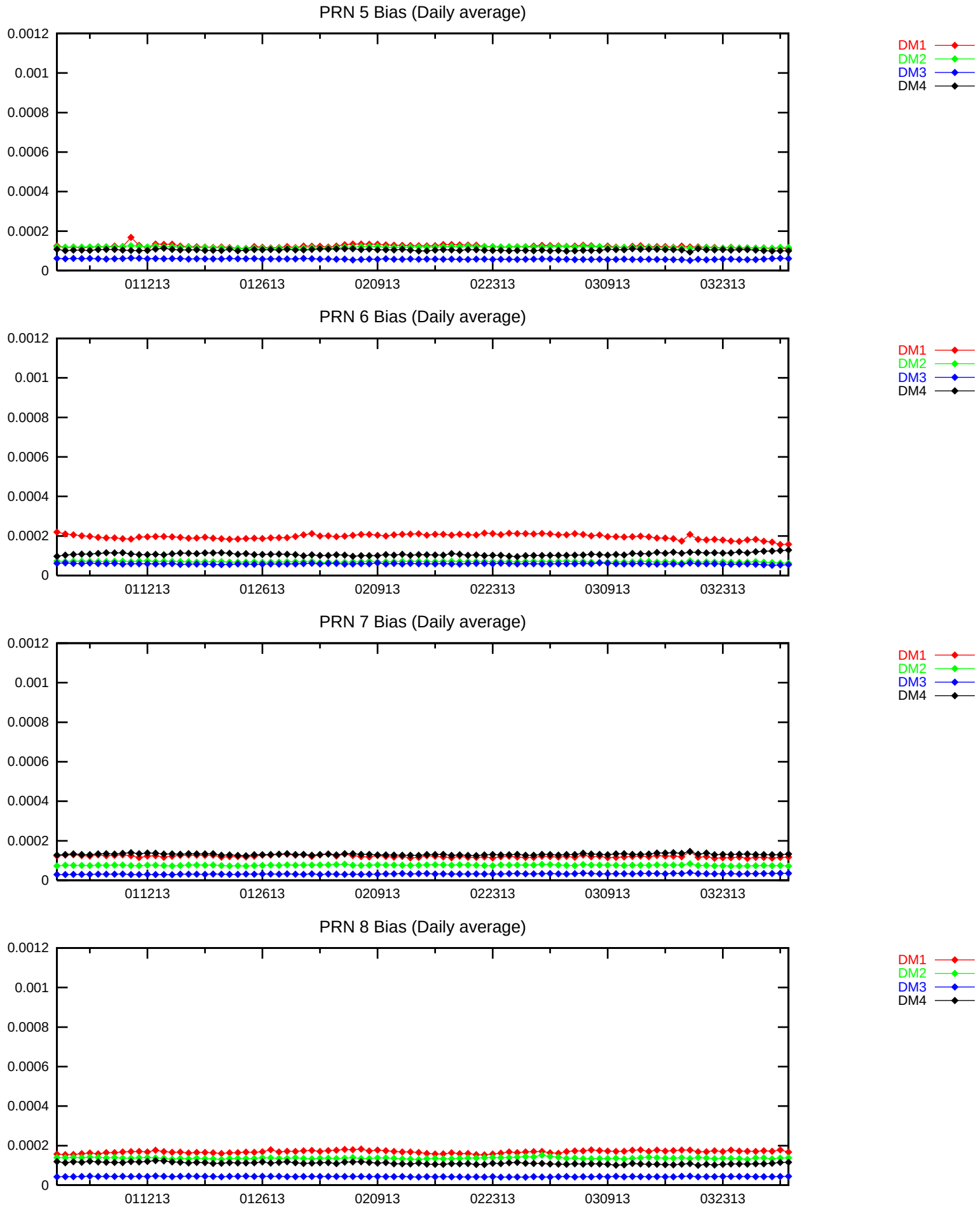


Figure 11-5 PRN Bias Average Trend (PRN 9 - PRN 12)

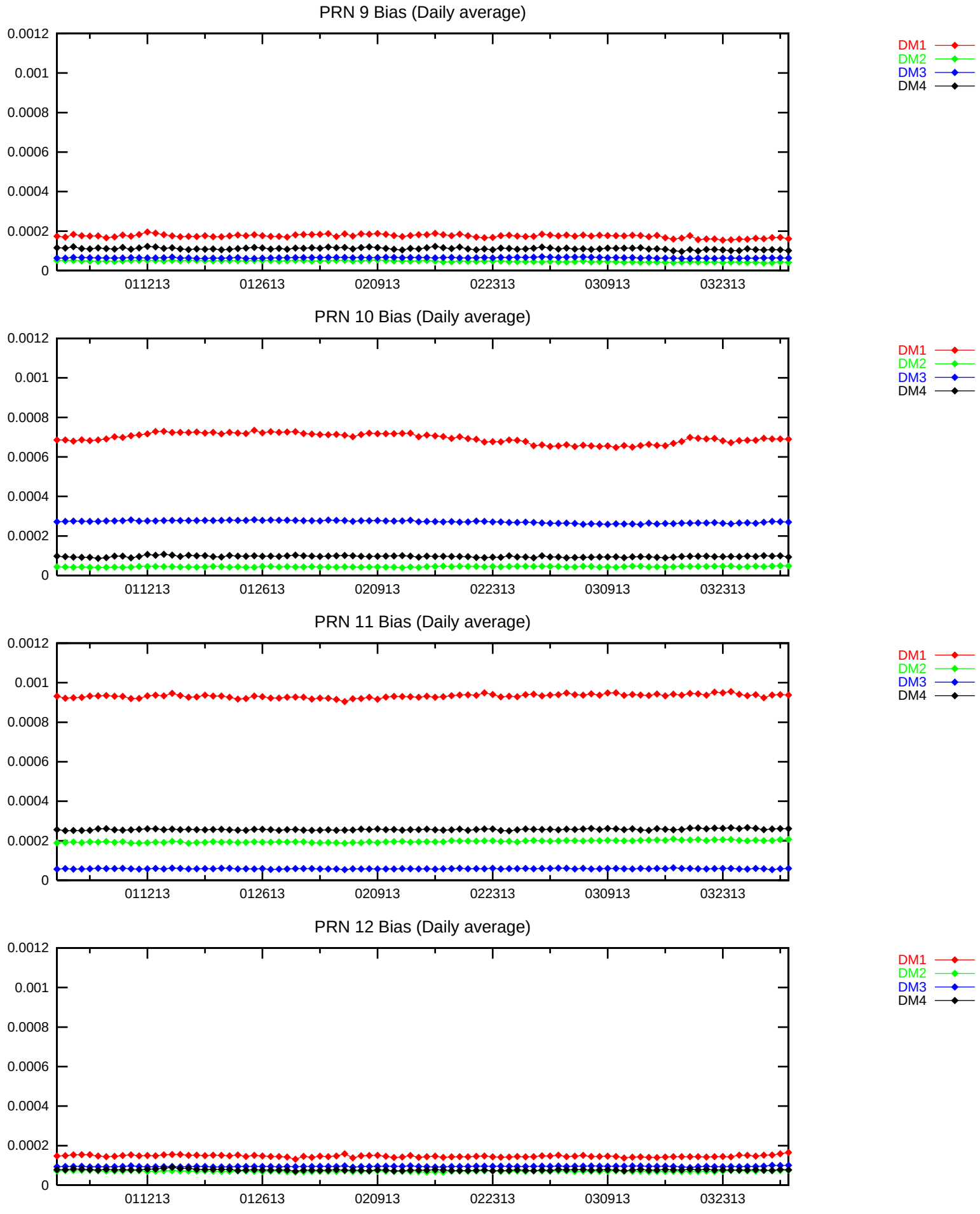


Figure 11-6 PRN Bias Average Trend (PRN 13 - PRN 16)

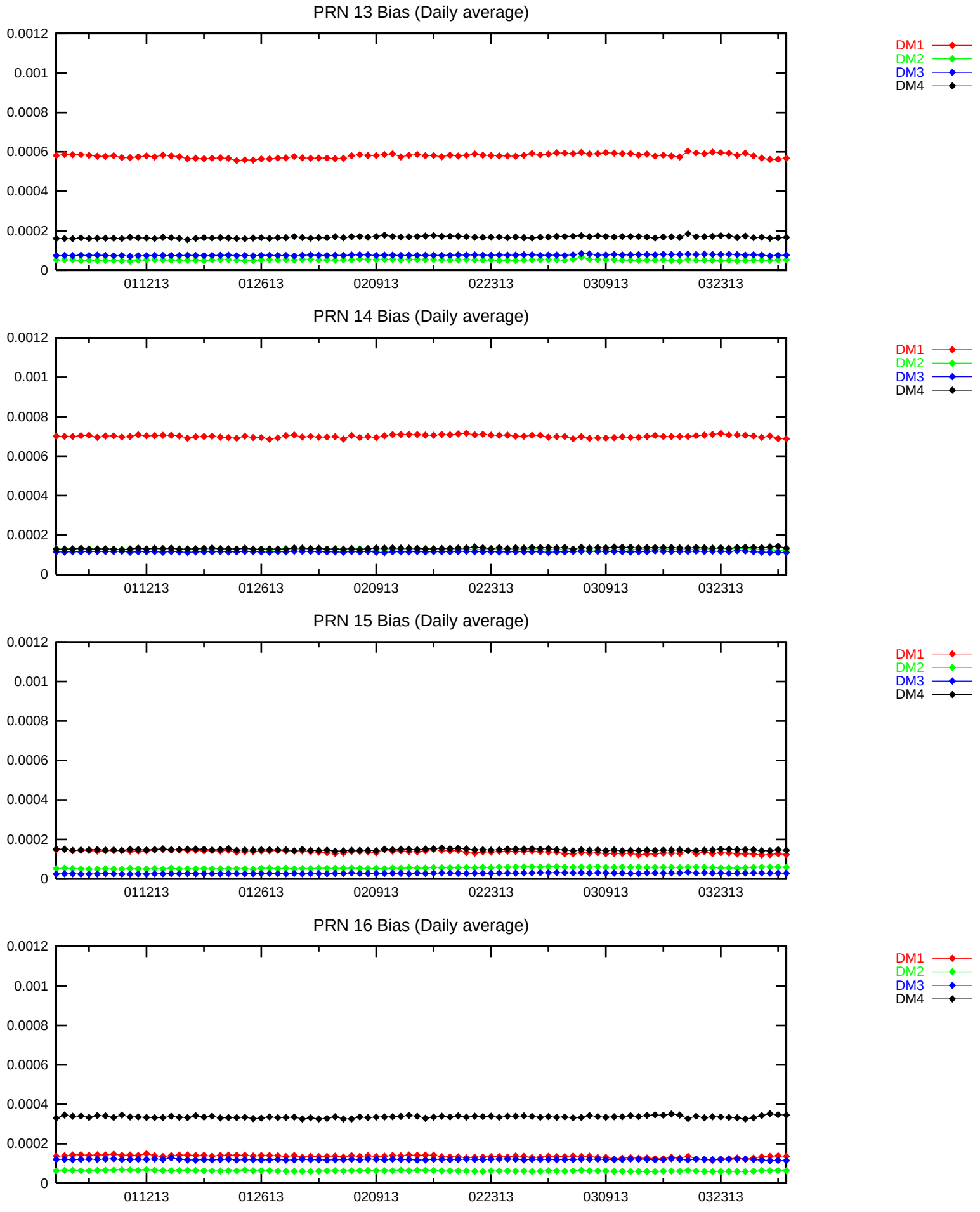


Figure 11-7 PRN Bias Average Trend (PRN 17 - PRN 20)

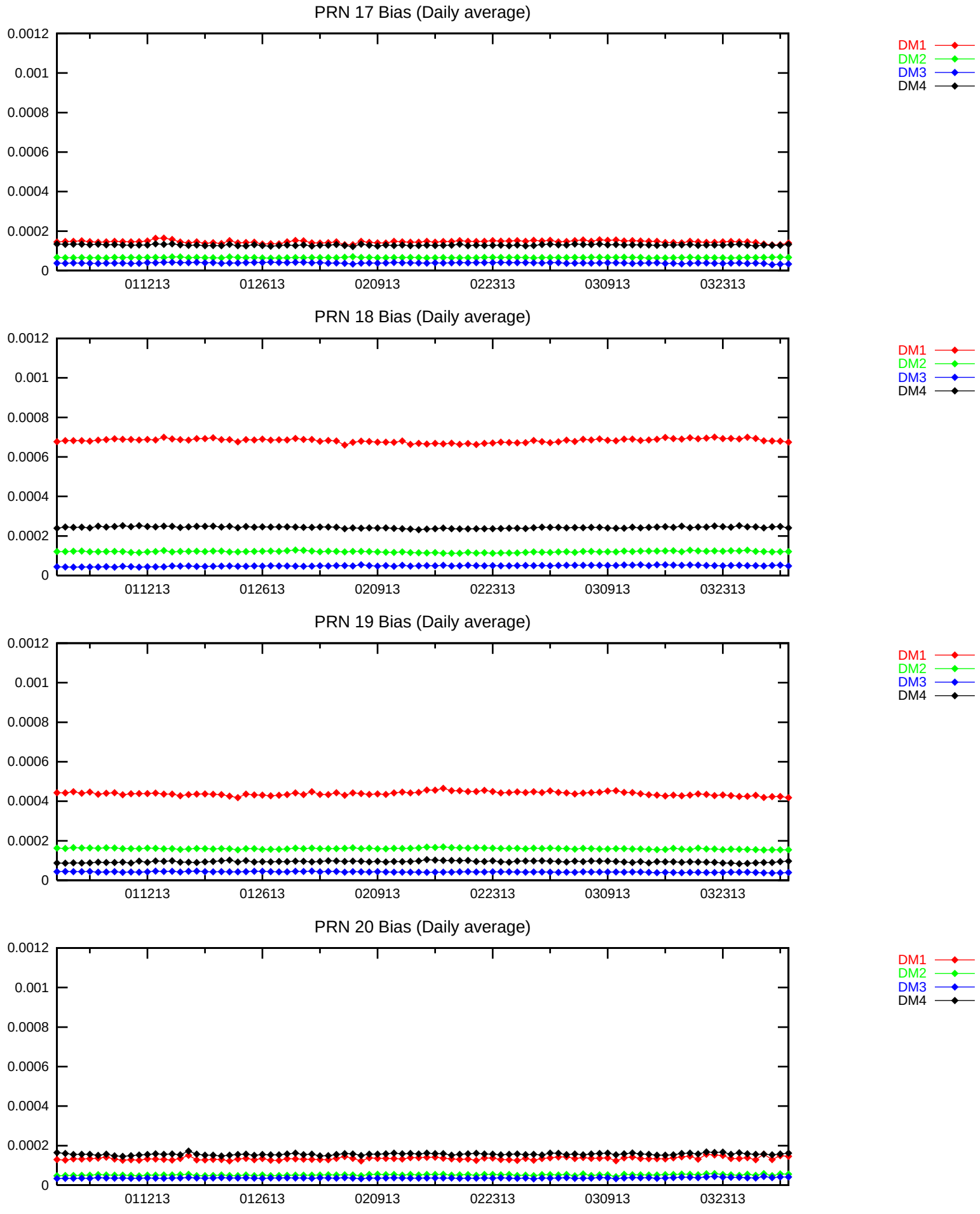


Figure 11-8 PRN Bias Average Trend (PRN 21 - PRN 24)

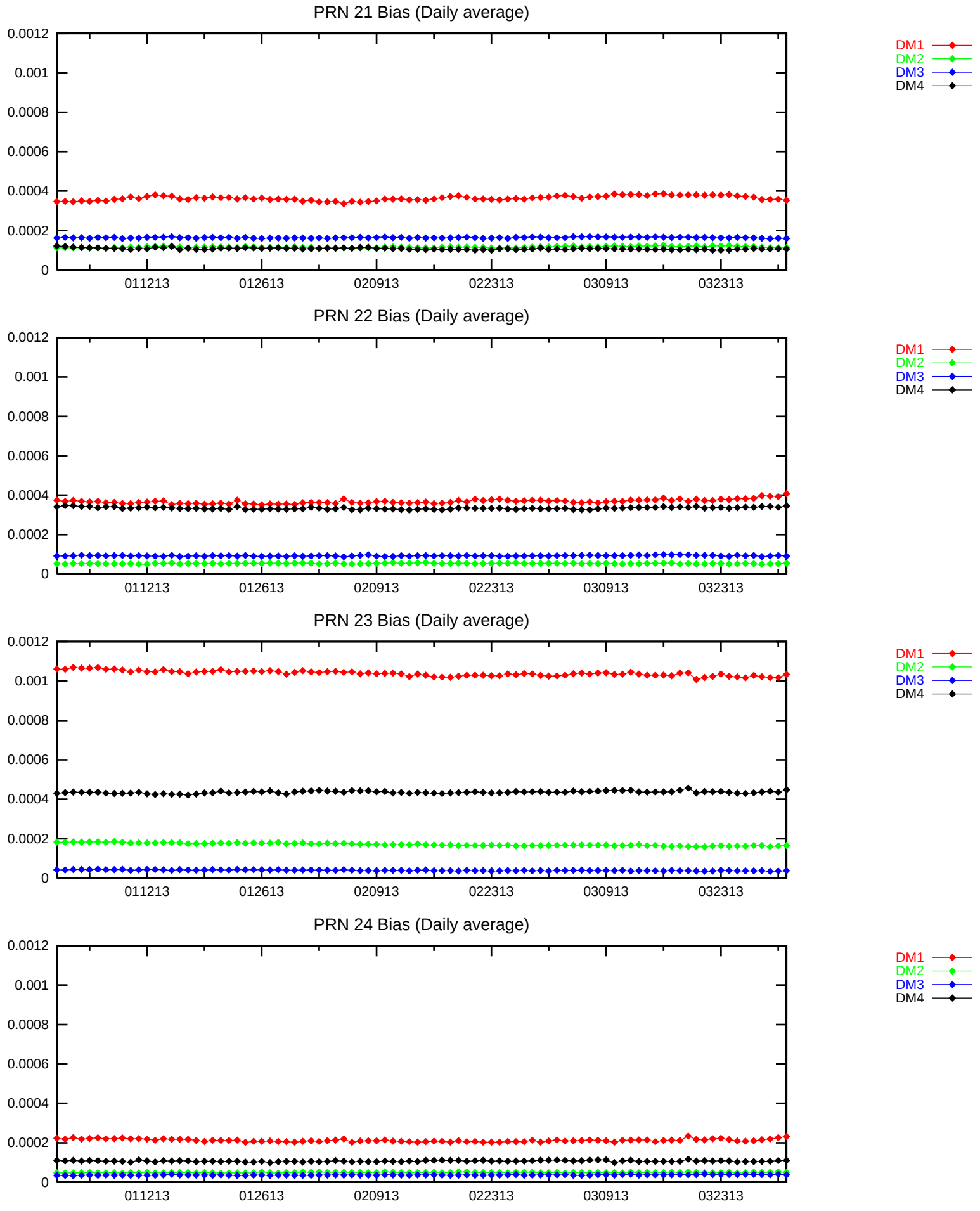


Figure 11-9 PRN Bias Average Trend (PRN 25 - PRN 28)

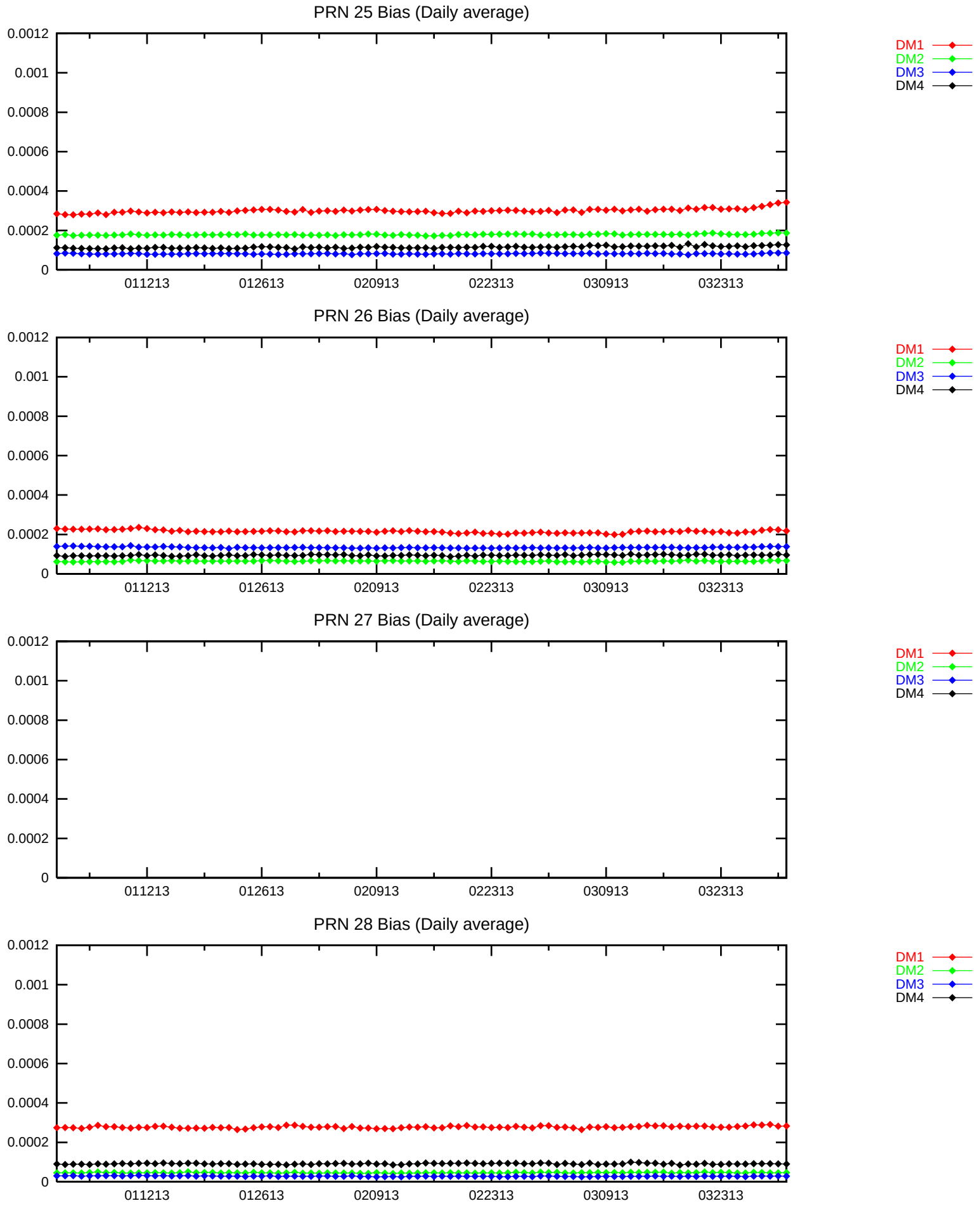
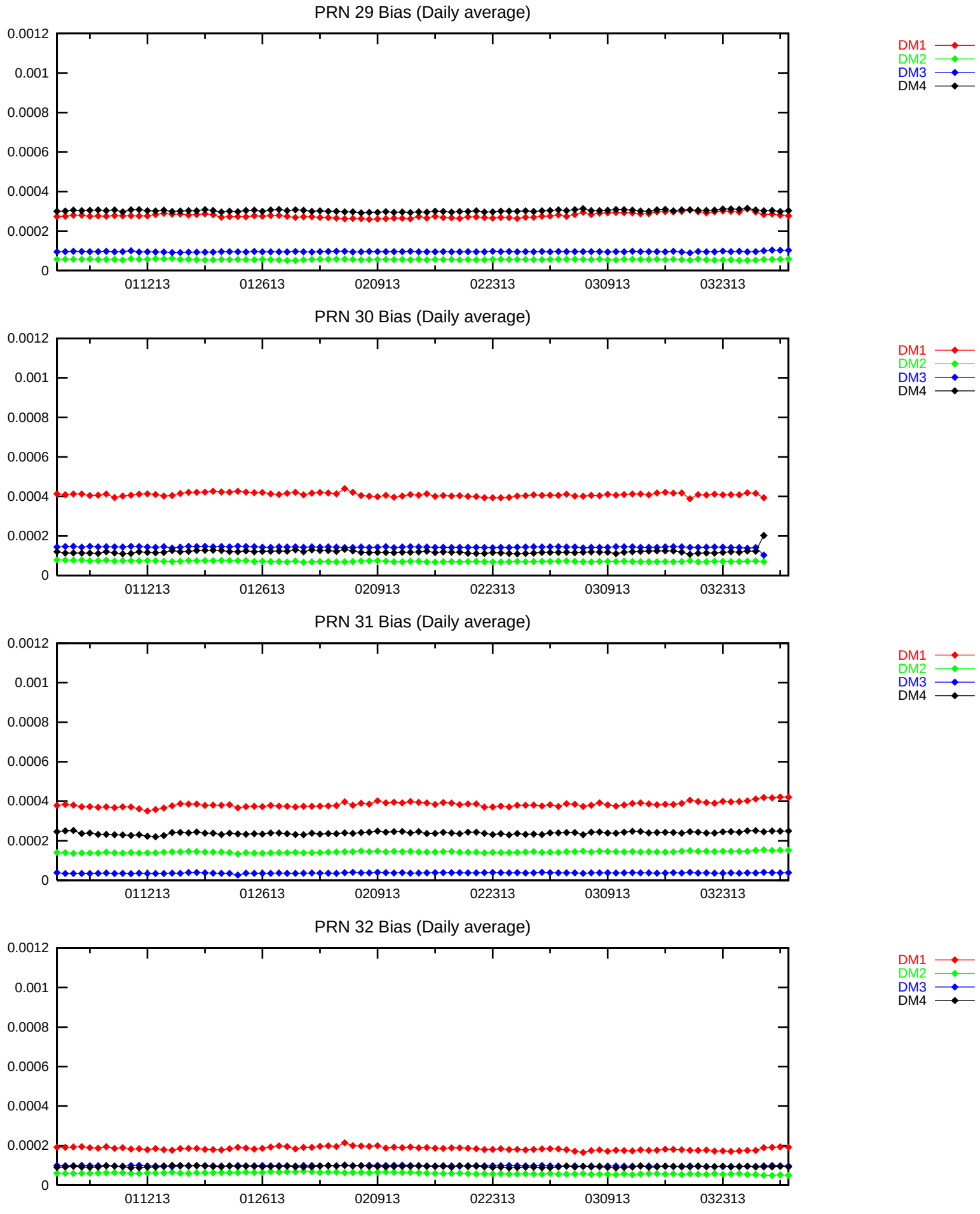


Figure 11-10 PRN Bias Average Trend (PRN 29 - PRN 32)



11.4 SQM Trips

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

Appendix A: Glossary

General Terms and Definitions

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

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

C&V. The Correction and Verification Subsystem.

CONUS. Continental United States.

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

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

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

DR. Discrepancy Report

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

GEO. Geostationary Satellite.

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

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

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

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

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

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

IGS. International GPS Service.

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

LNAV. Lateral Navigation.

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

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

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

MOPS. Minimum Operational Performance Standards.

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

Navigation Message. Message structure designed to carry navigation data.

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

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

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

RFI. Radio Frequency Interference.

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

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

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

SV. Space Vehicle.

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

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

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

VNAV. Vertical Navigation.

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

Appendix B: Additional Coverage Plots

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

Figure B-1 98% CONUS LP Availability Contour for the Quarter

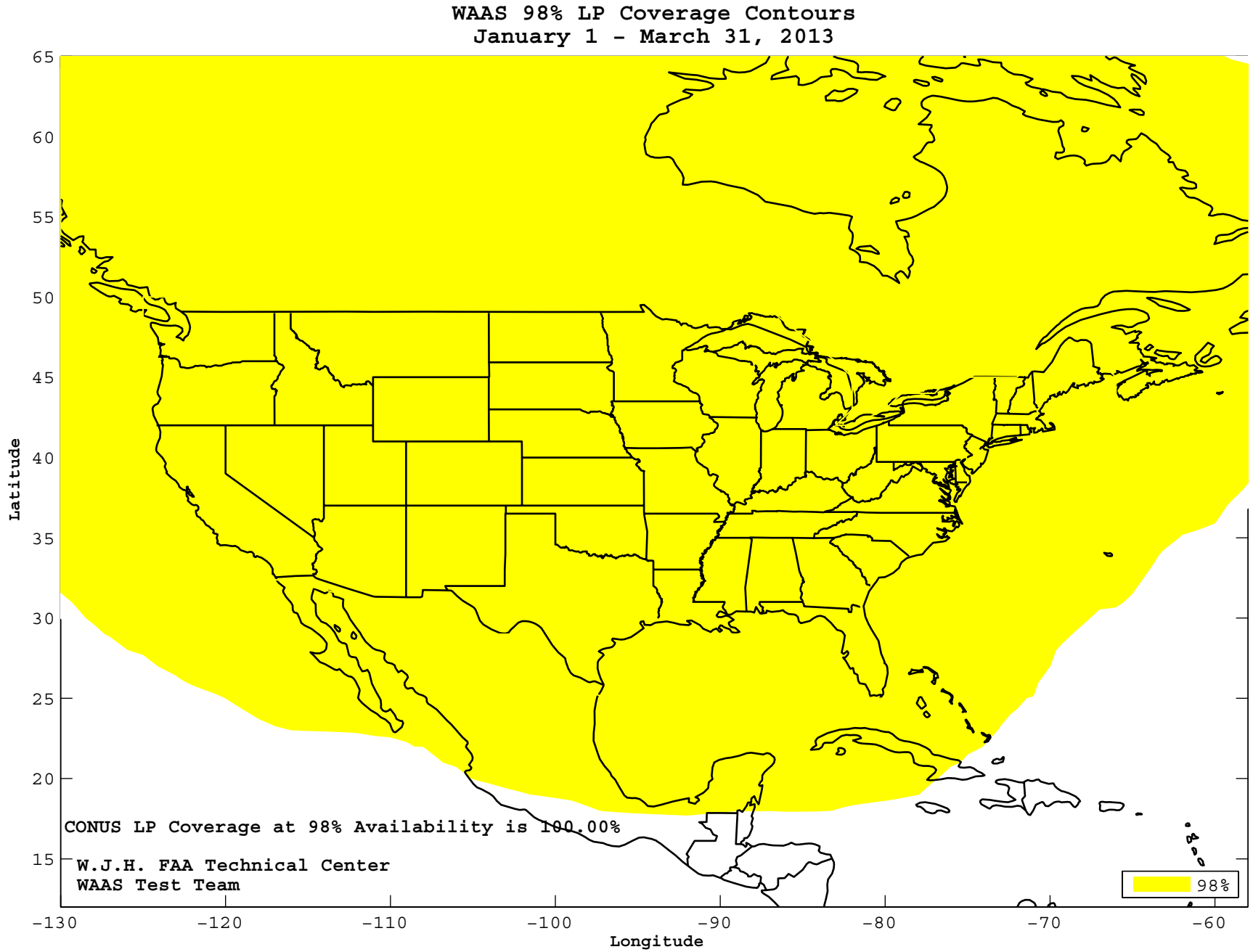


Figure B-2 98% Alaska LP Availability Contour for the Quarter

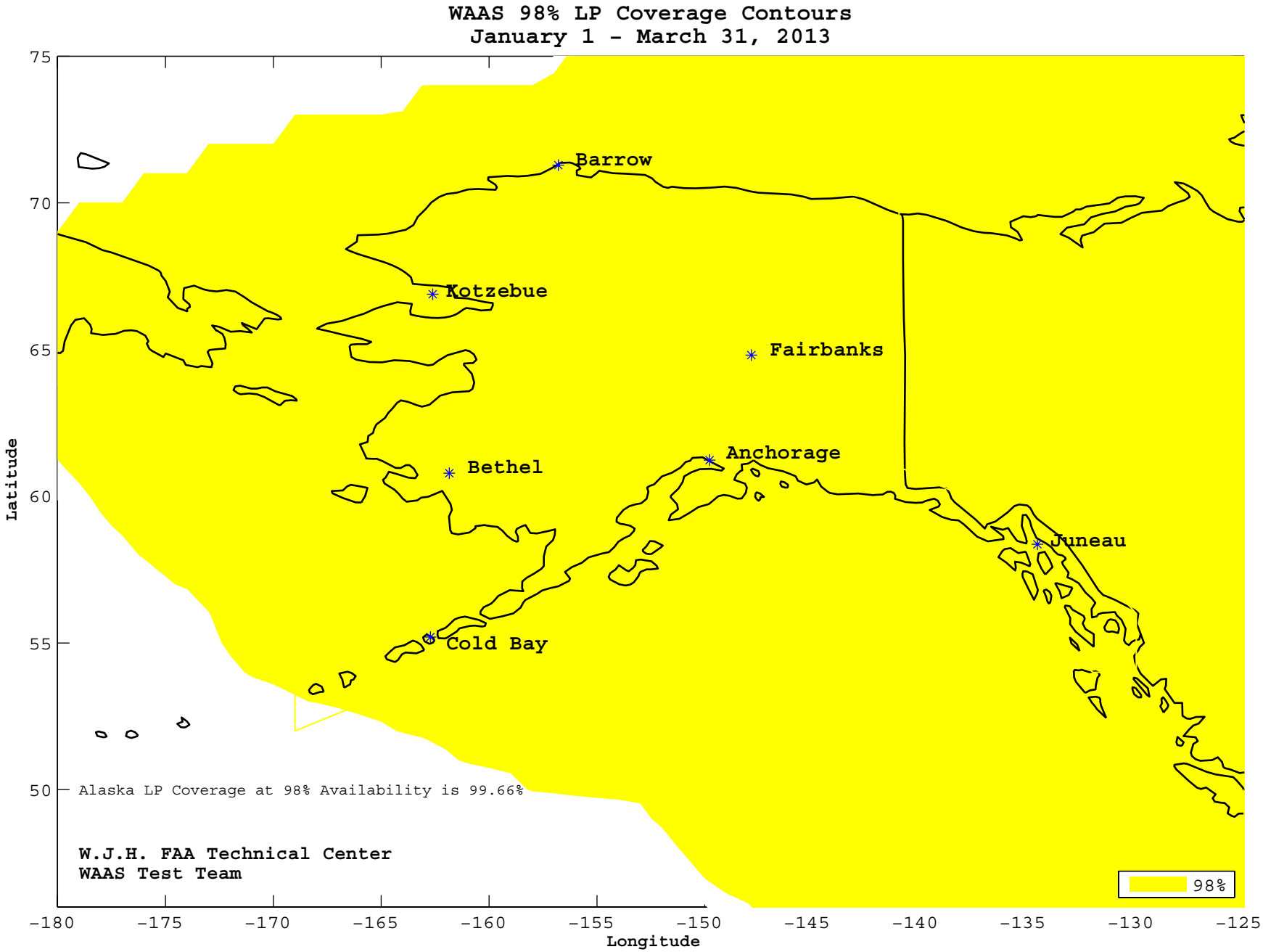


Figure B-3 98% CONUS LPV Availability Contour for the Quarter

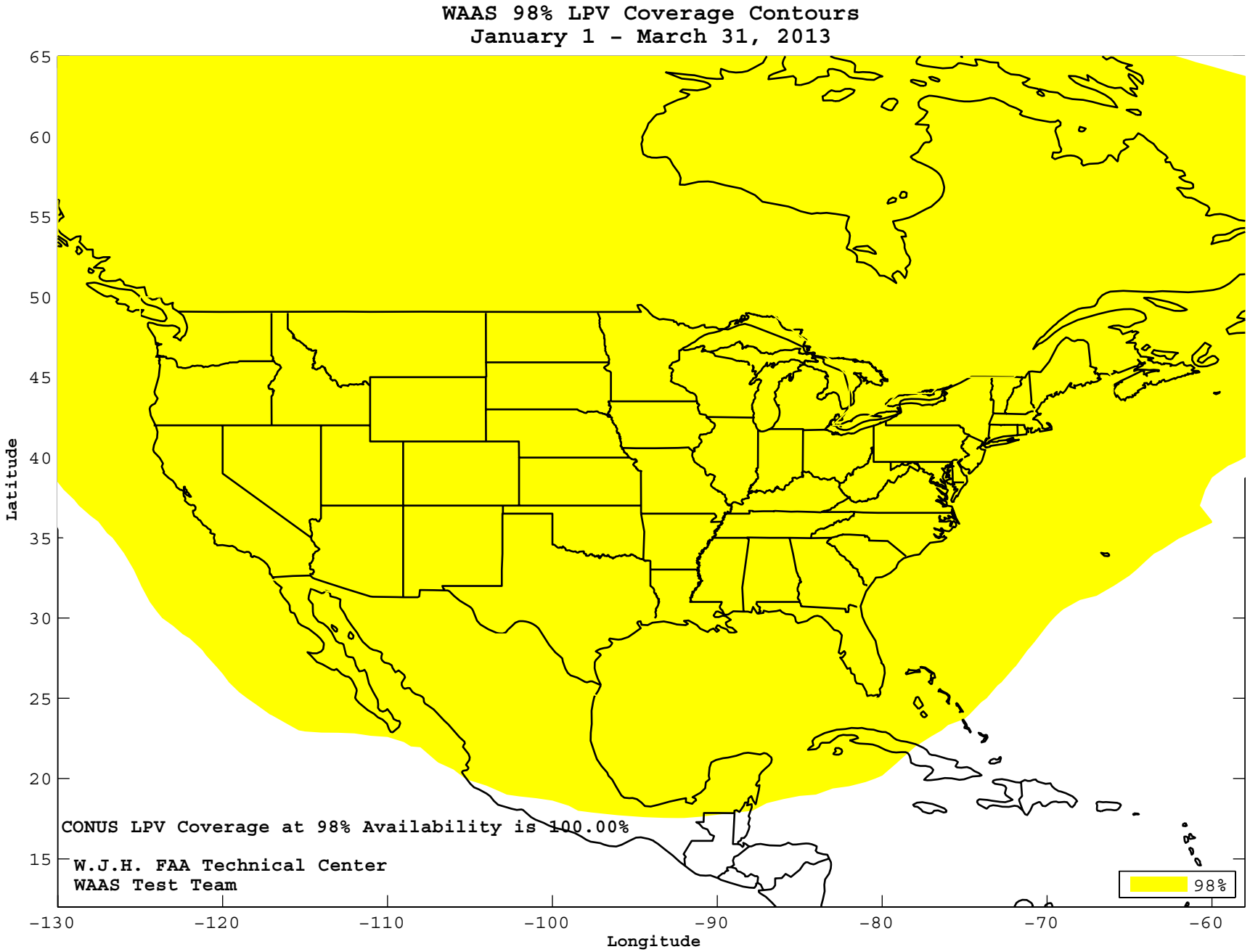


Figure B-4 98% Alaska LPV Availability Contour for the Quarter

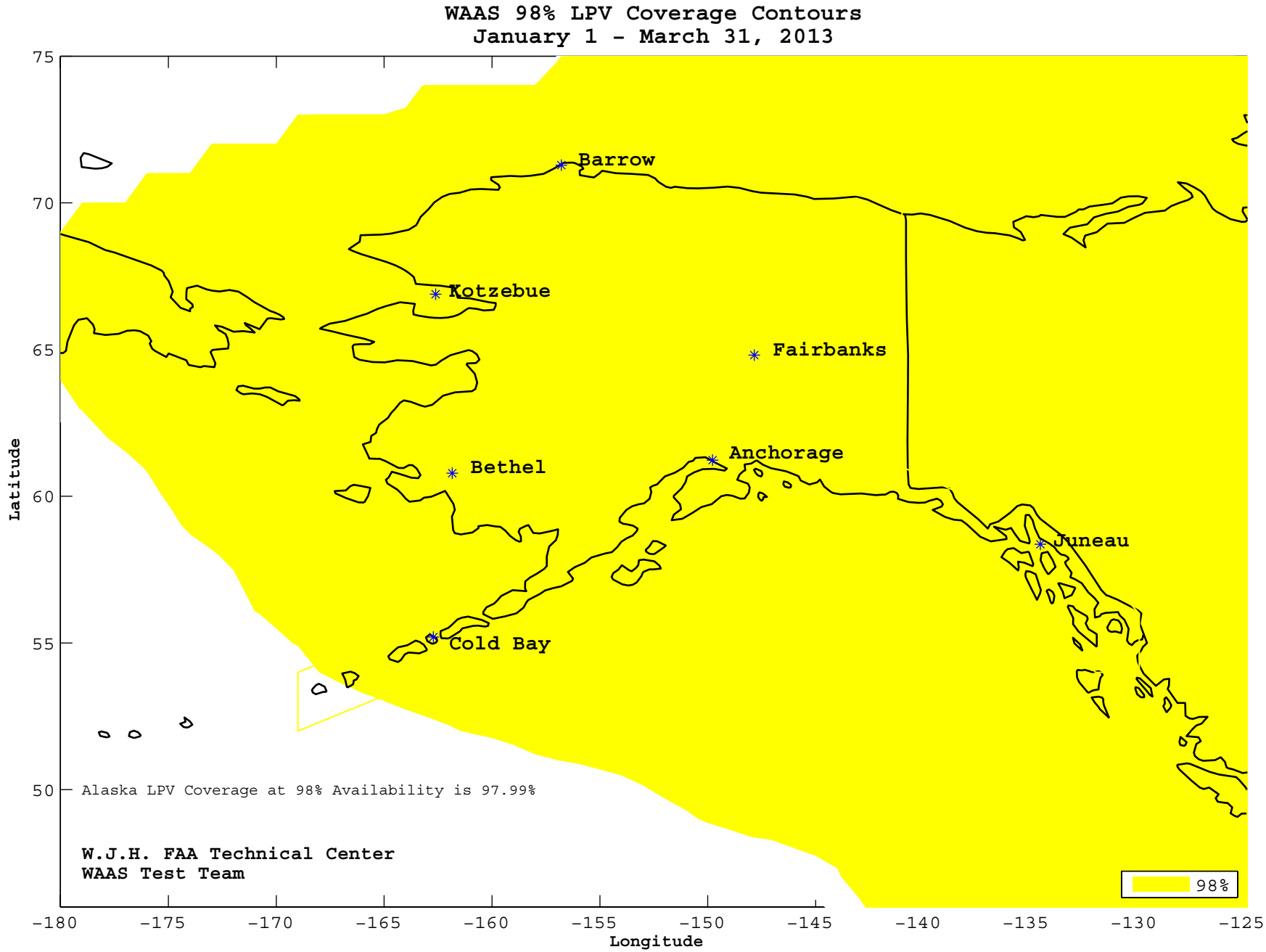


Figure B-5 99% CONUS LPV 200 Availability Contour for the Quarter

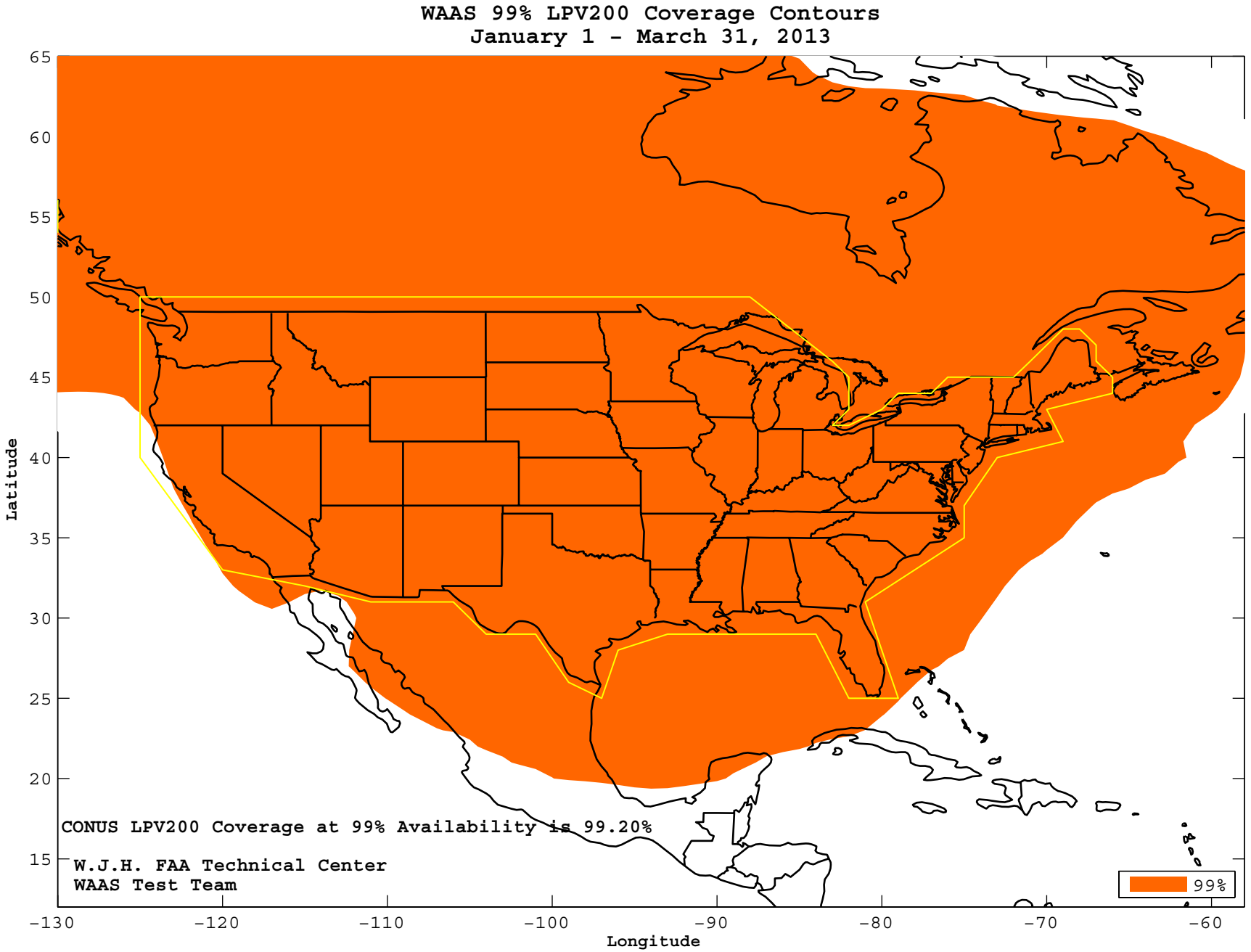


Figure B-6 99% Alaska LPV 200 Availability Contour for the Quarter