

WAAS Technical Report
William J. Hughes Technical Center
Pomona, New Jersey
6/22/2005

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DR#: Loss of Availability due to Satellite Maintenance, NANU 2005077 (SV 2)
GPS Week/Day: Week 1322 Day 1 (May 9, 2005)

Discussion:

On GPS Week 1322 Day 1, a loss of WAAS availability was observed over the CONUS service volume. This was a direct result of satellite maintenance that was forecast by the Coast Guard.

NANU 2005077 was issued by the Coast Guard forecasting satellite maintenance on SV 2 to occur on May 9th and 10th of 2005, which scheduled a 12-hour outage. The contents of this NANU are listed below.

2005077-----

NOTICE ADVISORY TO NAVSTAR USERS (NANU) 2005077
SUBJ: SVN61 (PRN02) FORECAST OUTAGE JDAY 129/1500 - JDAY 130/0300

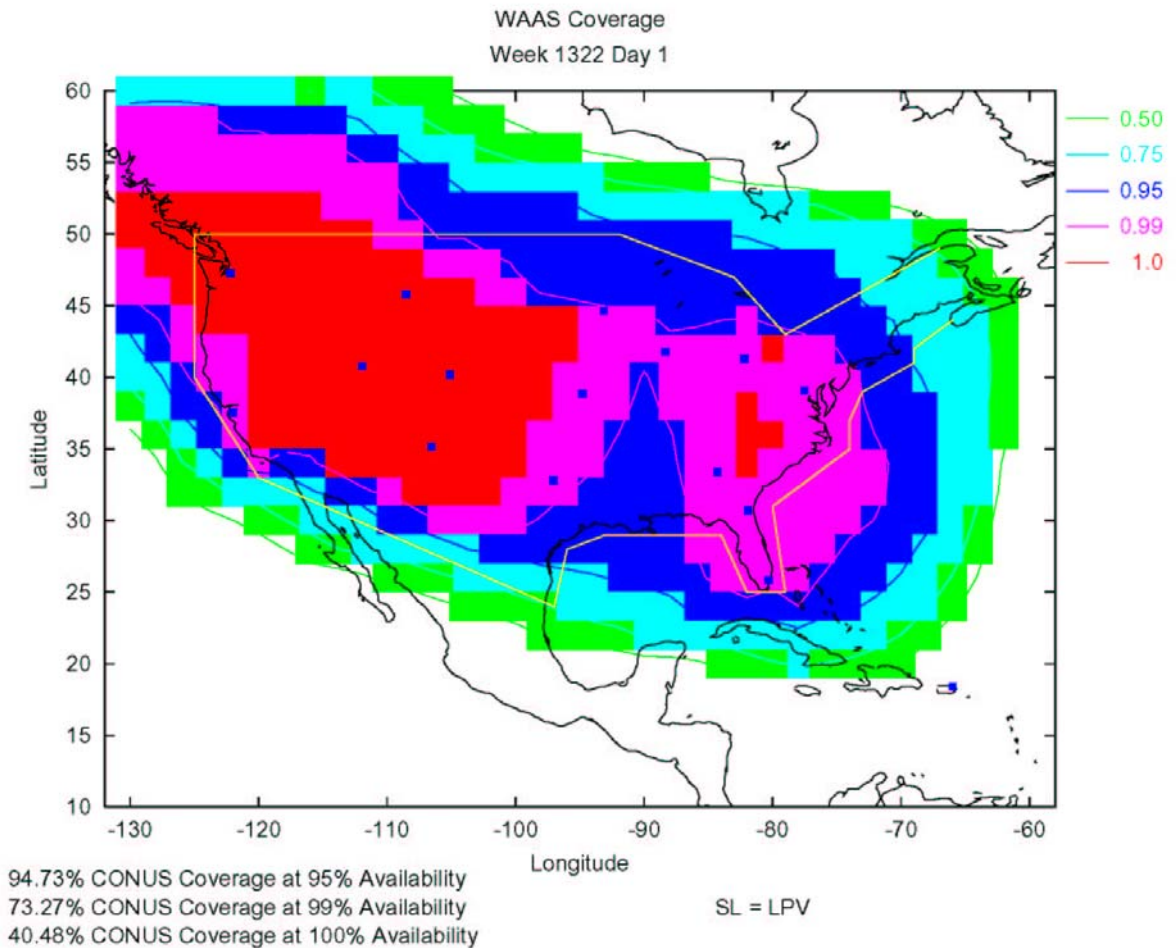
1. NANU TYPE: FCSTMX
 NANU NUMBER: 2005077
 NANU DTG: 041434Z MAY 2005
 REFERENCE NANU: N/A
 REF NANU DTG: N/A
 SVN: 61
 PRN: 2
 START JDAY: 129
 START TIME ZULU: 1500
 START CALENDAR DATE: 09 MAY 2005
 STOP JDAY: 130
 STOP TIME ZULU: 0300
 STOP CALENDAR DATE: 10 MAY 2005

2. CONDITION: GPS SATELLITE SVN61 (PRN02) WILL BE UNUSABLE ON JDAY 129
 (09 MAY 2005) BEGINNING 1500 ZULU UNTIL JDAY 130 (10 MAY 2005)
 ENDING 0300 ZULU.

3. POC: CIVILIAN - NAVCEN AT 703-313-5900, HTTP://WWW.NAVCEN.USCG.GOV
 MILITARY - GPS Support Center at
 HTTP://WWW.SCHRIEVER.AF.MIL/GPSSUPPORTCENTER, DSN 560-2541,
 COMM 719-567-2110, GPS@SCHRIEVER.AF.MIL,
 HTTP://WWW.SCHRIEVER.AF.MIL/GPS
 MILITARY ALTERNATE - 14 AF AIR & SPACE OPERATIONS CENTER, DSN 276-
9994,
 COMM 805-606-9994, V3SPACEAF.AOC@VANDENBERG.AF.MIL

Figure 1 shows the loss of LPV service in the Midwest regions of CONUS that was observed on Week 1322 Day 2 as a result of this maintenance. Coverage at 99% availability was reduced to 73.27% of the CONUS service volume on this day, whereas it typically approaches 90%.

Figure 1 – LPV Coverage for May 9, 2005



A summary NANU was issued following this satellite maintenance action. The contents of this summary NANU are listed below. Forecast NANUs provide users with a prediction of how long satellite maintenance will last, however the actual outage time generally differs from this. Predictions in a forecast NANU often set aside 12 or 24 hour block for maintenance, although the actual outage rarely last that long. Although 12 hours were forecast for this outage, it only lasted ~3 hours. The specifics of the outage's duration can be found in the summary NANU.

2005082-----

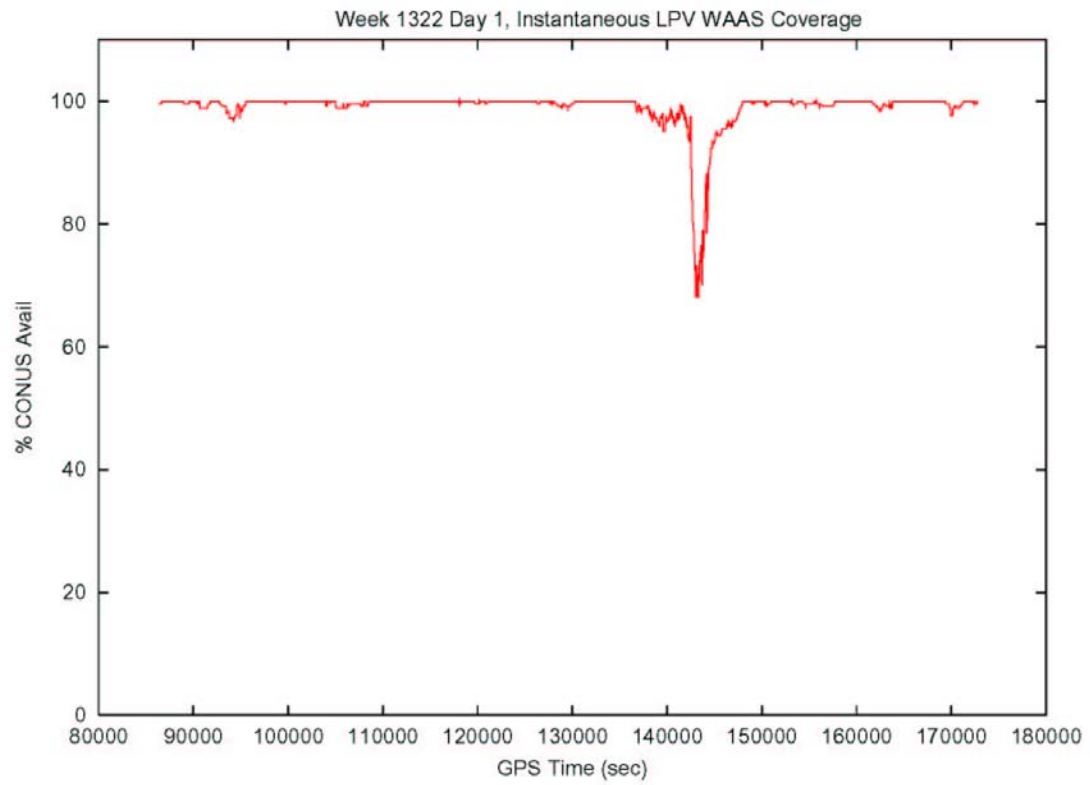
NOTICE ADVISORY TO NAVSTAR USERS (NANU) 2005082

SUBJ: SVN61 (PRN02) FORECAST OUTAGE SUMMARY JDAY 129/1500 - JDAY 129/1756

1. NANU TYPE: FCSTSUMM
 NANU NUMBER: 2005082
 NANU DTG: 091807Z MAY 2005
 REFERENCE NANU: 2005077
 REF NANU DTG: 041434Z MAY 2005
 SVN: 61
 PRN: 02
 START JDAY: 129
 START TIME ZULU: 1500
 START CALENDAR DATE: 09 MAY 2005
 STOP JDAY: 129
 STOP TIME ZULU: 1756
 STOP CALENDAR DATE: 09 MAY 2005
2. CONDITION: GPS SATELLITE SVN61 (PRN02) WAS UNUSABLE ON JDAY 129
 (09 MAY 2005) BEGINNING 1500 ZULU UNTIL JDAY 129 (09 MAY 2005)
 ENDING 1756 ZULU.
3. POC: CIVILIAN - NAVCEN AT 703-313-5900, [HTTP://WWW.NAVCEN.USCG.GOV](http://www.navcen.uscg.gov)
 MILITARY - GPS Support Center at
 [HTTP://WWW.SCHRIEVER.AF.MIL/GPSSUPPORTCENTER](http://www.schriever.af.mil/gpssupportcenter), DSN 560-2541,
 COMM 719-567-2110, GPS@SCHRIEVER.AF.MIL,
 [HTTP://WWW.SCHRIEVER.AF.MIL/GPS](http://www.schriever.af.mil/gps)
 MILITARY ALTERNATE - 14 AF AIR & SPACE OPERATIONS CENTER, DSN
 276-9994,
 COMM 805-606-9994, V3SPACEAF.AOC@VANDENBERG.AF.MIL

Figure 2 shows a trend of instantaneous coverage (30 second sampling) for May 9, 2005. Note the correspondence between the time indicating when the satellite outage occurred listed in the summary NANU (15:00 – 17:56 Zulu/GMT corresponds to ~140400 – 151200 GPS Time) and the time during which the loss of coverage occurred. The percentage of the CONUS volume available for LPV service dropped below 90% from GPS Time 142560 – 144510 (15:36 – 16:08 GMT Time).

Figure 2 – Instantaneous LPV Coverage for Week 1322 Day 1



Conclusion:

The loss of availability observed on Week 1322 Day 1 was due directly to the absence of SV 2 as a PA ranging source.