WAAS Technical Memorandum
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Pomona, New Jersey
4/29/10
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DR #94 PRN 17 NANU Affects WAAS Coverage
GPS Week/Day: Week 1581 Day 2 (4/27/2010)

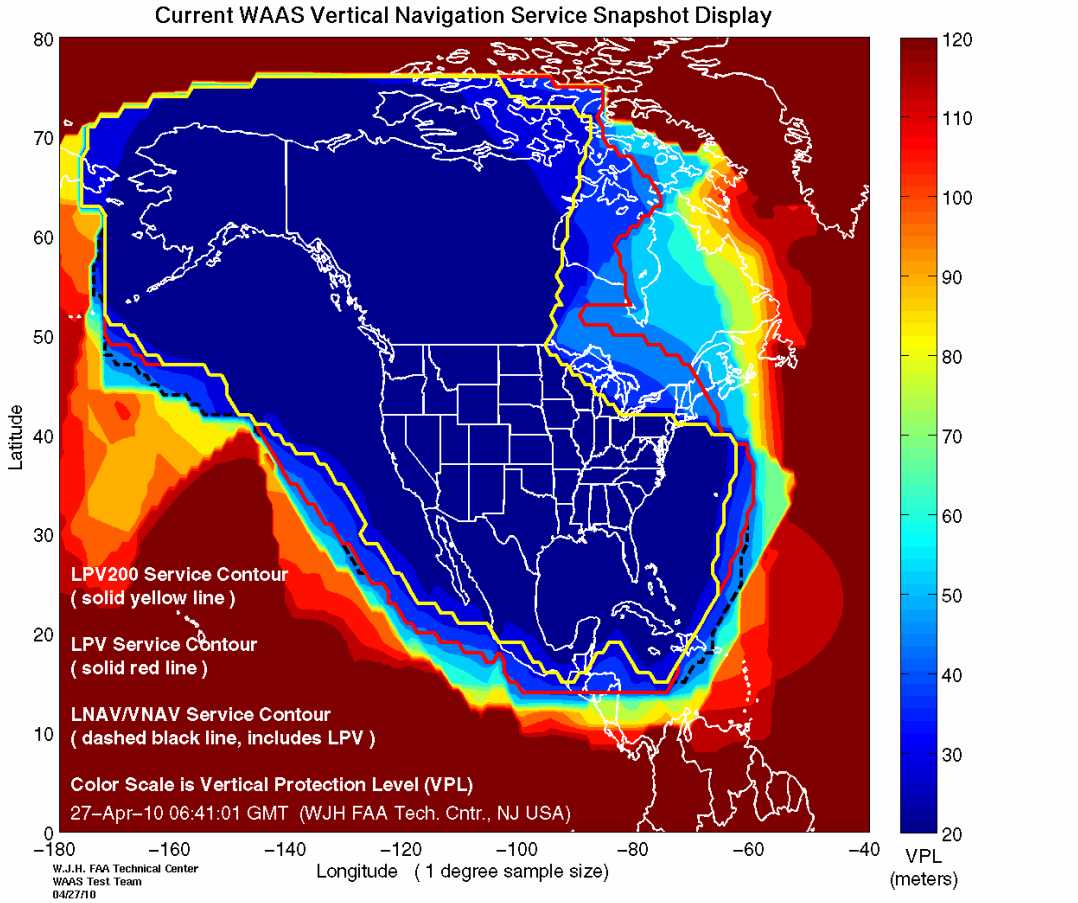
Discussion:

On April 27, 2010, a GPS NANU (Notice Advisory to Navstar User) was issued which alerted GPS users that PRN 17 was unusable from 03:19 GMT to 06:42 GMT on April 27, 2010. There was a small loss of LPV coverage in CONUS and a significant loss of LPV200 coverage in CONUS. There was a small effect on LPV200 coverage in Alaska.

PRN 17 is a critical satellite to the geometry in CONUS. The loss of PRN 17 as a ranging source during the NANU times caused a reduction in WAAS coverage because it created a poor satellite constellation geometry near the end of the NANU times.

Figure 1 shows a plot of WAAS Coverage when LPV200 service was unavailable in the northeastern region.

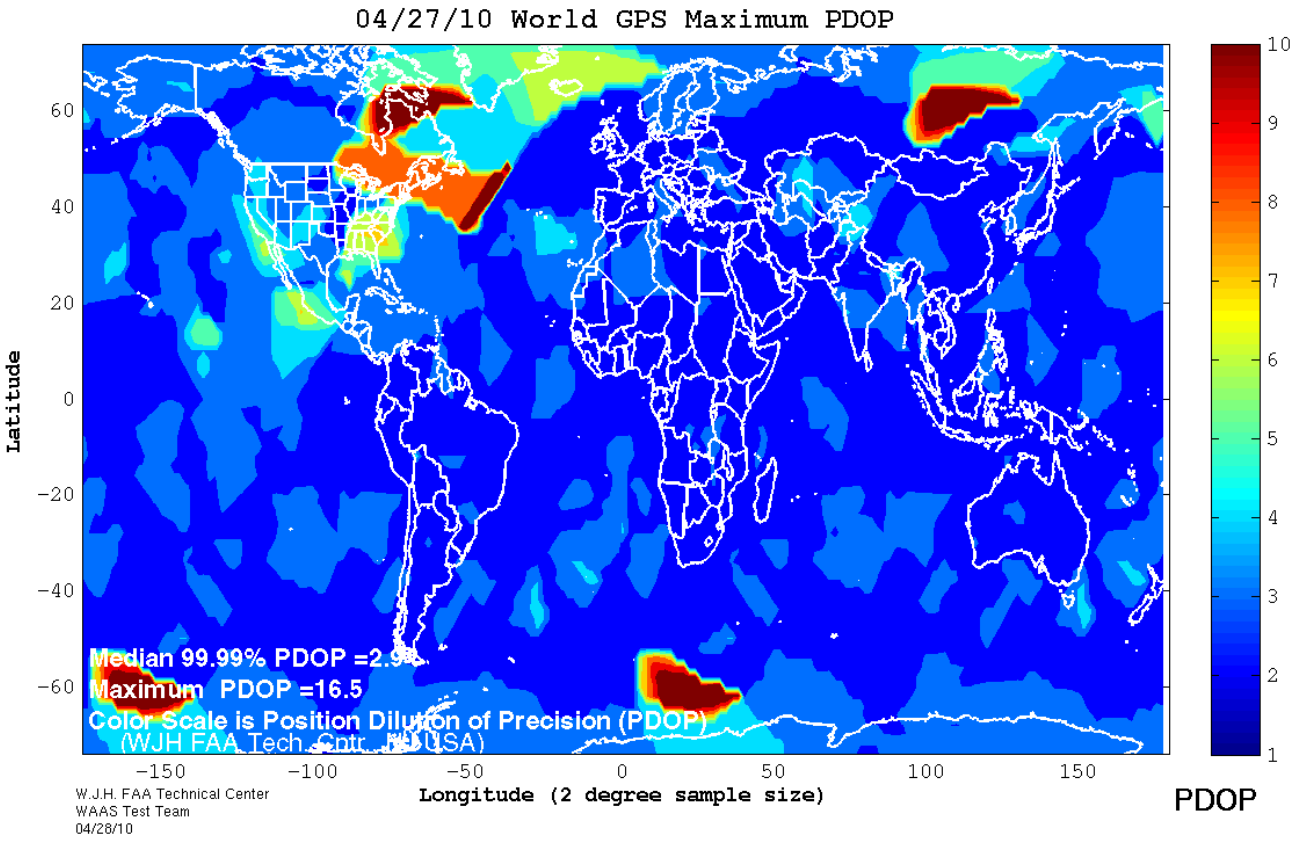
Figure 1: WAAS Service at 06:41 GMT



The LPV200 outage in California started at about 05:11 GMT and lasted about 50 minutes. The LPV200 outage in the northeast United States started about 06:29 GMT and lasted about 25, minutes.

Figure 2 shows a plot of the SPS PDOP at the time of the coverage drop. The PDOP plot emphasizes how the loss of PRN 17 led to a poor geometry, particularly in the northeast United States. The maximum PDOP over northeast CONUS was 8.

Figure 2: World DOP Plot for 4/27/10



Figures 3 and 4 show plots of LPV and LPV200 coverage respectively, for 4/27/10.

Figure 3: LPV Coverage on 4/27/10

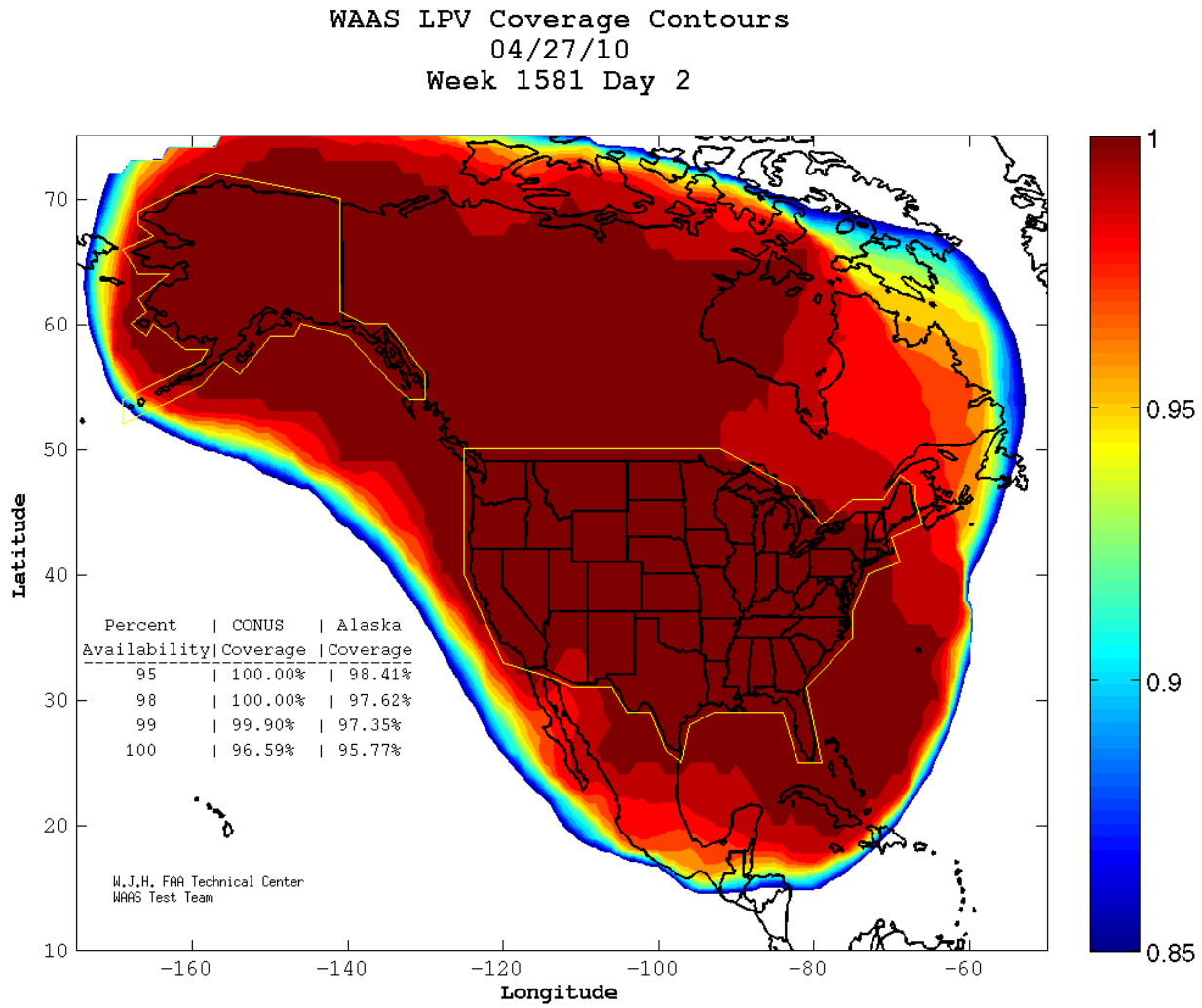
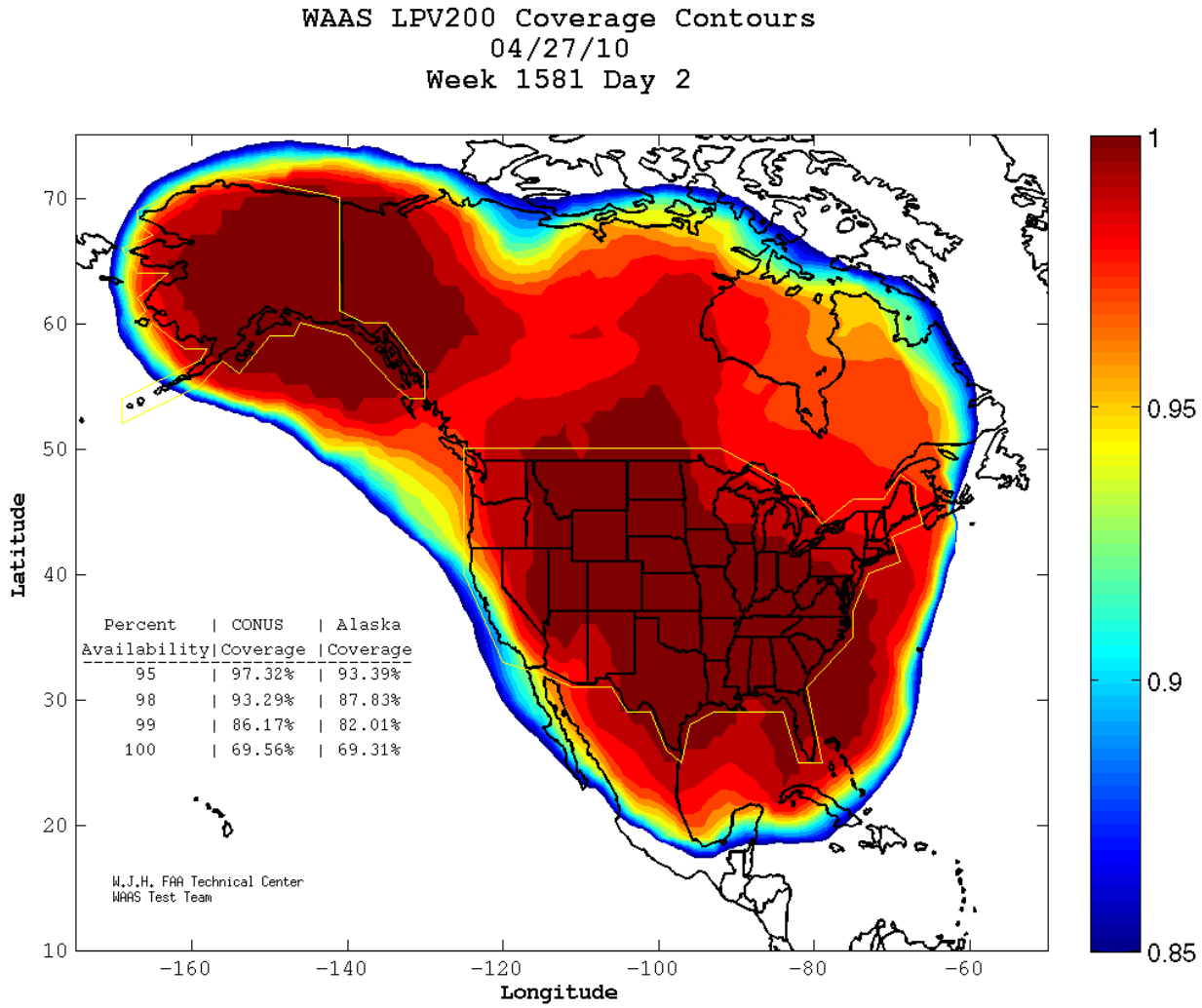


Figure 4: LPV200 Coverage on 4/27/10



Conclusion:

The PRN 17 outage had a large impact on CONUS LPV200 coverage, particularly in the northeastern region. The 100% LPV200 availability dropped to 69.56%. The coverage drop was caused by poor satellite constellation geometry during the time of the PRN 17 NANU. RNP1, RNP3, and LP coverage were unaffected by the PRN17 NANU.