

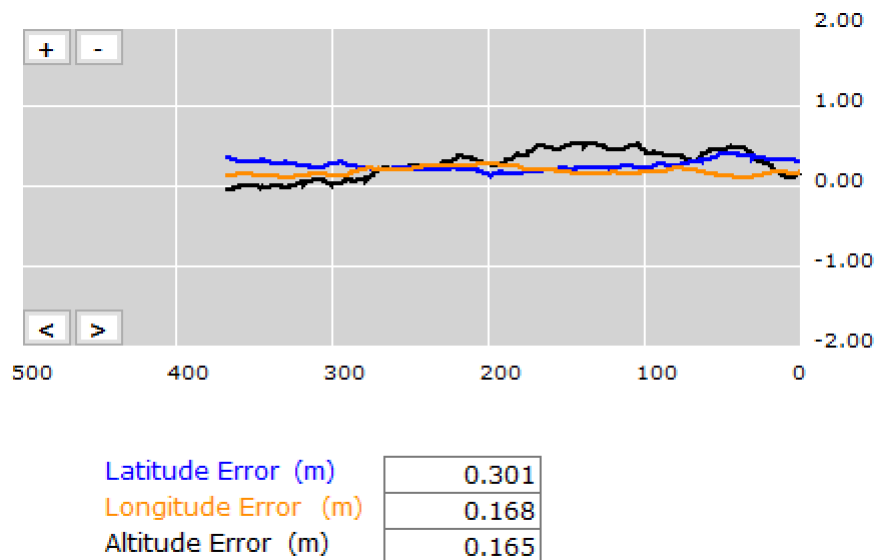
Thanks Joel. Wow, it's been a long time since I browsed the rplstoday community!

As you know, I've worked a lot with WAAS with respect to non-aviation, high-precision GNSS. I publish my first article about the non-aviation use of WAAS in 2004.

There's nothing official from the FAA, but I've spoken to some FAA engineers and have been told that they run an OPUS solution on the WAAS reference stations (38 of them) once a year and adjust the reference station coordinates, if needed. I don't think there's a scheduled date for them to perform this. I would not be surprised if it was 18, or even 24 months at times depending on workload. The reference datum is IGS08 (maybe IGS14 now). I use an epoch date of .5 year, not knowing the true epoch date.

The NTSB publishes a quarterly WAAS performance report. The last one is dated October 2018. <http://www.ntsb.tc.faa.gov/reports/waaspan66.pdf>. The one for Q4 2018 should be published soon. As you can see in the October 2018 report (Table 2-1 PA 95%), 95% horizontal accuracies are in the 50-100cm range using WAAS with a high-performance receiver. L2 doesn't help. There is desire but no plans for WAAS to go to multi-constellation or a dual frequency solution in the foreseeable future, according to an FAA brief I attended last September.

That said, WAAS was architected for integrity more than high-accuracy. I was at Stanford Univ (its GNSS lab folks architected WAAS) some time ago, and we discussed trading some integrity for accuracy. So, there are some non-aviation receivers designed to exploit WAAS/SBAS accuracy while giving up some integrity (integrity in the aviation world is crazy high). The result is that non-aviation receivers exploiting WAAS/SBAS results in improved accuracy even over Table 2-1 in the WAAS PAN report. Here's a screen shot from a test I did in Hawaii last year. Mind you, the local Trimble rep and even the NGS state advisor has dismissed WAAS in Hawaii because it is far removed from the mainland. But every time I've ran a test in Hawaii (several since 2009), the results have been very similar to the mainland US.



I think this about as good as WAAS accuracy can get...2D RMS horizontal in the 50cm range. Of course, this is open sky. Under tree canopy, things get nutty. That's another discussion altogether. Some solid performers in clear sky take a dump under canopy....worst yet, they give indicators they are performing well. There's nothing worse than a receiver that lies to you.

In general, I agree with John Hamilton that WAAS has been dismissed in the past, at least in the beginning (it was declared operational in 2003). Part of it is the reference frame, but the mainstream software (eg. Esri Collector and others) have built in real-time transformers to NAD83/2011. However, it's been a solid performer over the past decade.

John is correct about the demise of DGPS beacon stations. I'll go a step further and say that WAAS was THE reason for dismantling the USCG beacon DGPS service. In the beginning, the Coast Guard dismissed WAAS and put up a fight for several years, but after awhile it was hard to argue against WAAS performance. That said, WAAS' Achilles Heel is a well-behaved ionosphere. If there's a geomagnetic storm like the one in October 2003, WAAS precision will blow out many, many meters and although DGPS precision would blow out too, it would likely not be as bad as WAAS because DGPS is a single baseline solution in close proximity to a DGPS reference station (eg. 150km) whereas WAAS is a modeled solution with only 38 reference stations covering Canada, US, and Mexico.

With respect to Esri, I can tell you geodesy is on their minds. They'll get there. It's a major challenge when you consider the legacy data and software its users will have to deal with. FYI, Collector can now be configured as a 3D "survey-grade" data collection tool (when setup properly). And, with their revived Autodesk partnership, I think you'll see some interesting developments.